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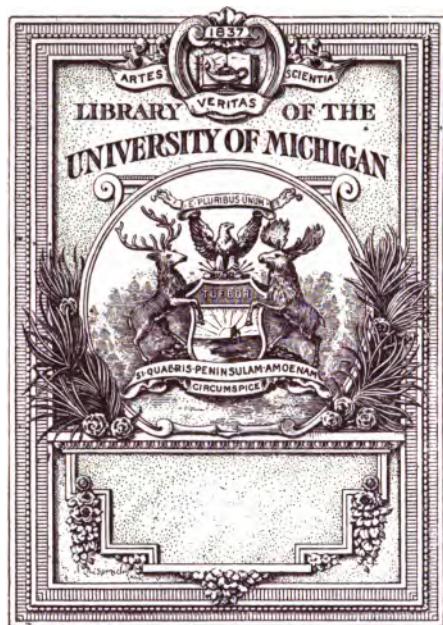
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FOURTH BIENNIAL REPORT

OF THE

KANSAS

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STATE HORTICULTURAL SOCIETY,

CONTAINING

THE PROCEEDINGS OF ANNUAL MEETING HELD AT FORT SCOTT IN
DECEMBER, 1894, AND ANNUAL MEETING HELD AT
LAWRENCE IN DECEMBER, 1895.

EDITED BY THE DEPUTY SECRETARY, WILLIAM H. BARNES.

VOL. XX.

PUBLISHED BY THE STATE.



TOPEKA.

THE KANSAS STATE PRINTING CO.:

J. K. HUDSON, State Printer.

1896.



WILLIAM H. BARNES, Deputy Secretary.

LETTER OF TRANSMITTAL.

OFFICE OF THE KANSAS STATE HORTICULTURAL SOCIETY,
STATE-HOUSE, TOPEKA, KAS., January 31, 1896.

To His Excellency, E. N. MORRILL, Governor:

With pleasure we herewith submit for your careful examination and consideration a copy of the fourth biennial report of the Kansas State Horticultural Society.

Horticulture has entered upon a new and energetic era in our beloved state, and we are pleased to know that you are one of its most earnest and sincere patrons; and we hope to receive at your hand every encouragement you can consistently extend to us as one of the state's most beneficent organizations. For all of which it will be our earnest endeavor to be, as a Society, most worthy.

Respectfully submitted.

FRED. WELLHOUSE, President.

EDWIN TAYLOR, Secretary.

WILLIAM H. BARNES, Acting Secretary.

AN EXPLANATION.

We have no apologies to offer for this book. The last legislature allowed a man not favorable to Horticulture to rule that 100 pages were enough for our biennial needs. (The last report, Vol. 19, covered 364 pages.) Hence we have been compelled to leave out the President's addresses, addresses of welcome and the responses, also poetry, repetitions, reminiscences, etc., and confine the work as closely to Horticulture as possible. It will therefore be found all solid meat, and if any writer finds his "paper" curtailed, he or she will kindly place the blame as noted above.

Again, much of our Horticultural matter requires *immediate* attention, and in some cases is worthless after another year. Experiments and statistics are stale reading, to the energetic Horticulturist, when two years old. We should publish a horticultural report of about 200 pages of live up-to-date matter every year. Nothing less should satisfy *Kansas* Horticulturists.

EDWIN TAYLOR, Secretary.

WILLIAM H. BARNES,

Acting Secretary, and Compiler.

FRUIT DISTRICTS.**No. 1.—Northern District.**

Trustee, WILLIAM CUTTER, Junction City.

ATCHISON,	GOVE,	NORTON,	SALINE,
BROWN,	GRAHAM,	OSBORNE,	SHAWNEE,
CHEYENNE,	JACKSON,	OTTAWA,	SHERIDAN,
CLAY,	JEFFERSON,	PHILLIPS,	SHERMAN,
CLOUD,	JEWELL,	POTTAWATOMIE,	SMITH,
DECATUR,	LEAVENWORTH,	RAWLINS,	THOMAS,
DICKINSON,	LINCOLN,	REPUBLIC,	TREGO,
DONIPHAN,	LOGAN,	RILEY,	WALLACE,
ELLIS,	MARSHALL,	ROOKS,	WASHINGTON,
ELLSWORTH,	MITCHELL,	RUSSELL,	WYANDOTTE.
GEARY,	NEMAHA,		

No. 2.—Central District.

Trustee, SAMUEL REYNOLDS, Lawrence.

ANDERSON,	GREELEY,	MORRIS,	WABAUNSEE,
BARTON,	HAMILTON,	OSAGE,	PAWNEE,
CHASE,	(North of Arkas. river),	LINN,	RENO,
COFFEY,	HARVEY,	LYON,	RICE,
DOUGLAS,	HODGEMAN,	MARION,	RUSH,
FINNEY,	JOHNSON,	McPHERSON,	SCOTT,
FRANKLIN,	KEARNY,	MIAMI,	STAFFORD,
GARFIELD,	(North of Arkas. river),	NESS,	WICHITA.
GRAY,	LANE,		

No. 3.—Southern District.

Trustee, GEORGE W. BAILEY, Wellington.

ALLEN,	CRAWFORD,	HASKELL,	NEOSHO,
BARBER,	EDWARDS,	KEARNY,	PRATT,
BOURBON,	ELK,	(South of Arkas. river),	SEDGWICK,
BUTLER,	FORD,	KINGMAN,	SEWARD,
CHAUTAUQUA,	GRANT,	KIOWA,	STANTON,
CHEROKEE,	GREENWOOD,	LABETTE,	STEVENS,
CLARK,	HAMILTON,	MEADE,	SUMNER,
COMANCHE,	(South of Arkas. river),	MONTGOMERY,	WILSON,
COWLEY,	HARPER,	MORTON,	WOODSON.

OFFICERS FOR 1896.

President.

FRED. WELLHOUSE.....Topeka.

Vice-President.

J. W. ROBISONEl Dorado.

Secretary.

EDWIN TAYLOREdwardsville.

Treasurer.

FRANK HOLINGERRosedale.

Deputy and Acting Secretary.

WILLIAM H. BARNES, at the office and rooms of the Society in the state capitol, Topeka.

STANDING COMMITTEES FOR 1896.

Nomenclature and New Fruits.

To study new fruits and report on them, also to correct improper and faulty names.

WILLIAM H. BARNES, Topeka.

A. H. BUCKMAN, Topeka.

G. C. BRACKETT, Lawrence.

B. F. SMITH, Lawrence.

G. F. ESPENLAUB, Rosedale.

Vegetable Gardening.

Study and report on commercial value of vegetable products, new and old, and on the manner of growing, harvesting, packing and marketing green vegetables, touching on commission selling and faults of transportation.

WILLIAM H. BARNES, Topeka.

FRED. ESPENLAUB, Rosedale.

C. H. LONGSTRETH, Lakin.

Botany and Vegetable Physiology.

To study and report on any new, strange or peculiar growths or sports.

CLARENCE B. HOLINGER, Rosedale.

PROF. A. S. HITCHCOCK, Manhattan.

MRS. M. M. CARSON, Wellington.

Small Fruits.

To study and report on new varieties and new methods of planting, growing, harvesting and marketing all small fruits.

J. F. CECIL, Topeka.

FRED. EASON, Lansing.

A. CHANDLER, Argentine.

Entomology.

To study and report on the nature and habits of insects injurious to horticulture, and the best time and means of eradicating them; also, to study and report on our insect friends, either directly beneficial or as enemies of the injurious insects.

PROF. E. A. POPENOE, Manhattan.

FRANK HOLINGER, Rosedale.

CLARENCE CHANDLER, Argentine.

Floriculture.

Commercial flowers (greenhouse, frame and garden) for profit; sale of cut blooms, pot-plants or flowering roots; growing, cutting, keeping, packing and marketing.

H. H. KERN, Bonner Springs.

MRS. L. HOUK, Hutchinson.

MRS. JOHN SIMMONS, Wellington.

Orchard Treatment.

To study and report the best, most economical, and most successful manner of growing orchards from seed or bud to bearing.

GUS THOMPSON, Edwardsville.

A. WILLIS, Ottawa.

JAMES McNICOL, Lost Springs.

A. OBENDORF, Centralia.

Handling Fruits, Vegetables, Etc.

To report on new ideas in pickers and picking, packages and packing; also, putting away to ripen or for winter use.

EDWIN TAYLOR, Edwardsville.

B. F. SMITH, Lawrence.

GEORGE RICHARDSON, Leavenworth.

WALTER WELLHOUSE, Fairmount.

Meteorology.

Study and report on extremes of temperature, the causes, and means of avoiding, overcoming or protecting against them.

PROF. F. H. SNOW, Lawrence.

Forestry.

To study and report the best varieties of trees, and the best means of growing them for windbreaks, shade and timber, including a report on nut and wild-fruit trees.

J. B. THOBURN, Syracuse.

J. W. ROBISON, El Dorado.

E. D. WHEELER, Ogallala.

Geology and Soils.

We look to this committee to discover and report on nature of soil, location and aspect for growing to perfection the various products of horticulture.

PROF. E. HAWORTH, Lawrence.

Things new and old in this line come in a report from this committee.

PROFESSOR DINSMORE, Emporia.

Standing Committees—Concluded.**Vineyards**

Study and report on preparation for and growing of grapes from seed and cuttings; report on new varieties and on new conditions affecting older varieties.

L. HOUK, Hutchinson.

A. L. ENTSINGER, Silver Lake.
WILLIAM CUTTER, Junction City.

Horticulture Connected with Farming.

This committee should report on ways and means by which the farmer may grow choice fruits, fresh vegetables and flowers, not for commercial purposes, but for the enjoyment of himself and family, (fruits and berries for home use may be of better quality than shipping sorts); flowers, perennial, biennial and annual, shrubby, herbaceous or climbing, for the home; lawns, shade-trees, shrubbery, and other horticultural evidences of the farm-home adornment and comfort.

MISS LOUIE M. PANCOAST, Iola.

W. J. COOK, Olathe.

GERALD HOLINGER, Rosedale.

Landscape Gardening.

This committee reports on the laying out and beautifying of home grounds, school grounds, parks and public grounds.

PROF. J. B. WALTERS, Manhattan.

Ornithology.

Our bird friends and enemies; what birds to protect and what to destroy in the interests of horticulture.

PROF. L. L. DYCHE, Lawrence.

Experimental Horticulture.

Testing new fruits and horticultural products in our climate and soil at the State Agricultural College, Manhattan.

PROF. S. C. MASON, Manhattan.

Suggestions for the Advancement of Horticulture.

This committee has great latitude, and should be wide-awake to any scheme, idea or invention that is an improvement on the present style of growing, packing, preserving or marketing horticultural products.

E. B. COWGILL, Topeka.

SAMUEL REYNOLDS, Lawrence.

Every committee has all the latitude they choose to take in the true interest of Kansas Horticulturists, and it is hoped that every committee will work eagerly, earnestly and harmoniously, or else resign. The new horticultural era has no room for "dead-wood."

Insecticides.

This committee should examine the merits and claims of new and old insecticides to aid the horticulturists in choosing wisely which to use,

DR. A. NEWMAN, Lawrence.

Novelties in the Nursery Trade.

The title describes the duty of this committee, and it is hoped he will guard well the interests of Kansas horticulturists against useless novelties.

W. S. SCHELL, Fort Scott.

Needed Legislation.

While this is a grand committee, and we know much is required of them, yet we hope every horticulturist in Kansas who holds a ballot will see that it is cast for legislators who favor the horticultural interests of the state. No other is a true Kansan. Probe them before nominating them. Kansas must lead the horticultural column.

HON. W. C. EDWARDS, Topeka.

HON. EDWIN TAYLOR, Edwardsville.

HON. FRED. WELLHOUSE, Topeka.

Transportation.

F. D. COBURN, Topeka.

WILLIAM H. BARNES, Topeka.

Irrigation.

This committee can find plenty to do just now, as much by pointing out the rocks and shoals threatening shipwreck, as in any way. We hope they will be as wise and bold in condemning wrong, wasteful and weak plans and fixtures as in advising of good, strong, perfect and profitable methods.

GEORGE M. MUNGER, Eureka.

C. H. LONGSTRETH, Lakin.

E. B. COWGILL, Topeka.

DR. G. BOHER, Chase.

Keeping Fruits and Vegetables.

Examine and report on any process that will prolong the season of a fruit, either by bagging, drying, preserving, or in cellars, caves, or cold storage.

A. CHANDLER, Argentine.

F. HOLINGER, Rosedale.

GEO. RICHARDSON, Leavenworth.

ROLL OF MEMBERS.**HONORARY.**

Colman, Norman J., St. Louis, Mo.	Miller, Samuel, Bluffton, Mo.
Morse, Dr. L. D., St. Louis, Mo.	Kelsey, Prof. S. T., Kawana, N. C.
Murdfeldt, C. W., St. Louis, Mo.	Snow, Prof. F. H., Lawrence, Kas.
The President of the State Agricultural College, Manhattan, Kas.	
Chair of Chemistry and Mineralogy, Agricultural College, Manhattan, Kas.	
Chair of Botany and Horticulture, Agricultural College, Manhattan, Kas.	
Chair of Zoology and Entomology, Agricultural College, Manhattan, Kas.	
Chair of Household Economy and Hygiene, Agricultural College, Manhattan, Kas.	
Chair of Industrial Art and Design, Agricultural College, Manhattan, Kas.	
Lantz, Prof. David E., Agricultural College, Manhattan, Kas.	
Kedzie, Prof. R. C., Agricultural College, Lansing, Mich.	
Cook, Prof. A. J., Agricultural College, Lansing, Mich.	
Bailey, Prof. L. H., Cornell University, Ithica, N. Y.	
Burrill, Prof. T. J., Secretary American Society of Microscopists, Champaign, Ill.	
Forbes, Prof. S. A., State Entomologist, Champaign, Ill.	
Lintner, Prof. J. A., State Entomologist, Albany, N. Y.	
Plank, Prof. E. N., Botanist, Kansas City, Kas.	

LIST OF LIFE MEMBERS RESIDING IN KANSAS.

Allen, Martin, Hays City.	Leach, L. W., Kingman.
Billings, Ed., Prescott.	Litson, W. H., La Cygne.
Bishop, L., Osawatomie.	Lawrence, R. E., Wichita.
Bohrer, Dr. G., Chase.	Leach, Joseph, St. Marys.
Booth, Henry, Larned.	Marvin, James, Lawrence.
Brown, G. B., Fredonia.	Miles, S. W., Clay Centre.
Brackett, G. C., Lawrence.	McKee, John, Marysville.
Byram, E. T., Jewell City.	Mosher, J. A., Scandia.
Buckman, Thomas, Topeka.	Mosier, M. B., Salina.
Boggs, Theo., McPherson.	Mentch, J., Winfield.
Barnes, William H., Topeka.	Mohler, John, Osborne.
Cloughly, John, Parsons.	Popenoe, Prof. E. A., Manhattan.
Clark, J. G., Waveland.	Robson, J. W., Abilene.
Cutter, William, Junction City.	Randolph, J. V., Emporia.
Cook, Thos. F., Monrovia.	Sheffield, C. H., Delphos.
Dow, Charles A., Burlington.	Smith, W. W., LeRoy.
Diehl, E. P., Olathe.	Stayman, Dr. J., Leavenworth.
Fairchilds, Geo. T., Manhattan.	Schlacter, J. B., Sterling.
Falconer, John, Belleville.	Taylor, E. A., Beloit.
Harris, E. P., Lecompton.	Taylor, T. T., Hutchinson.
Harris, F. B., White City.	Trafton, N., Milford.
Hall, M., Newton.	Wellhouse, Fred., Topeka.
Holman, E. J., Leavenworth.	Weidman, J., Pleasant Valley.
Johnson, G. Y., Lawrence.	Wickersham, C. G., Parsons.
Kelsey, C. C., Humboldt.	Williams, J. L., Kansas City.
Longstreth, C. H., Lakin.	Williams, J. W., Holton.
Secretary of the Manhattan Horticultural Society.	
Secretary of the Johnson County Horticultural Society.	

LIFE MEMBERS LIVING IN OTHER STATES.

Allen, Abner, San Diego, Cal.	Henry, T. C., Denver, Colo.
Fosnot, W. E., Ocala, Fla.	Hicks, John S., Roslyn, N. Y.
Gale, Prof. E., Mangona, Fla.	Milliken, Robert, Nampa, Idaho.
Godfrey, A. N., Dayton, Wash.	Van Deman, H. E., Washington, D. C.

Roll of Members—Concluded.**LIST OF ANNUAL MEMBERS.**

(Each of whom paid \$1 to the Secretary, at Lawrence.)

Barnes, W. E., Vinland.	Maffett, G. W., Lawrence.
Chandler, A., Argentine.	Munger, G. M., Eureka.
Cook, W. J., Lawrence.	McNicol, James, Lost Springs.
Deming, N. P., Lawrence.	Orberdorf, A., Centralia.
Dickinson, A. E., Meriden.	Robison, J. W., El Dorado.
Eason, Fred., Leavenworth.	Schell, W. S., Fort Scott.
Edwards, W. C., Topeka.	Sears, F. H., Manhattan.
Espenlaub, G. F., Rosedale.	Stanley, T. A., Osawatomie.
Griess, A. H., Lawrence.	Sternberg, C. H., Lawrence.
Haines, D. S., Edwardsville.	Shields, D. M., Garnett.
Herrington, E., Baker.	Taylor, Edwin, Edwardsville.
Kern, H. H., Bonner Springs.	Thompson, J. A., Edwardsville.
Kimble, Sam., Manhattan.	Wiswell, John, Columbus.
Lampman, Samuel, Baldwin.	Wyant, Isaac, Severy.
Lux, Philip, Topeka.	

THE KANSAS STATE HORTICULTURAL SOCIETY was organized and incorporated December 15, 1869, at Ottawa, Kas., by William Tanner of Leavenworth, G. C. Brackett of Lawrence, Geo. T. Anthony of Leavenworth, S. T. Kelsey of Pomona (now of Kawana, N. C.), Dr. J. Stayman of Leavenworth, W. M. Howsley of Leavenworth (deceased 1879), C. B. Lines of Wabaunsee (deceased 1891).

THE CONSTITUTION provides for five kinds of memberships: (1) Honorary members—persons of eminent merit in horticulture, elected by vote of the Society. (2) Life members—those paying \$10 at one time, or in consecutive yearly installments of \$2.50. (3) Life members—those who have acted as county vice-president for 10 years, and are voted in by the Society. (4) Annual members—who on paying \$1 become members until the second day of the next succeeding annual meeting. (5) Annual members—delegates from active district and county Horticultural Societies, for the next subsequent meeting only. (6) Ladies attending the annual meetings may be enrolled as members without fee.

OFFICERS.—President, Vice-President, Secretary, and a Treasurer, elected by ballot every two years, at the regular annual meeting, and taking their office on the first day of the following July. Also, three Trustees, elected one at each annual meeting to serve three years, the term of each to begin at the close of the annual meeting when elected. The Secretary and Treasurer have the right to appoint deputies. The duty of a Vice-President is to organize a local Horticultural Society in his county, and report at each annual meeting on general horticulture in his respective locality. The Executive Board consists of the President, Vice-President, Secretary, Treasurer and the three Trustees, and has power to act for the good of the Society during the interim between annual meetings.

THE ANNUAL MEETING is held in December of each year at a place chosen by the Executive Board.

IN MEMORIAM.

WILLIAM TANNER

Died at his home in Leavenworth, Kas., January 22, 1896, aged 77 years. He was the organizer and first President of this, the first Horticultural Society west of the Mississippi river. In the Kansas Farmer, January, 1867, appeared the following letter from his pen, signed "Pomologist."

KANSAS POMOLOGY.

"Editor Kansas Farmer: Under this head I wish to make a suggestion to the fruit-growers and vine-dressers of this state, with the view of organizing a society; to be denominated The Kansas Pomological Society.

"That such a society is much needed, all will admit. Many know that our people are continually being imposed upon by unscrupulous tree-venders, who are recommending and selling to them varieties of fruit-trees and plants that are entirely unsuited to our climate, as well as under erroneous names. By uniting together we shall acquire strength for ourselves, and be enabled to impart that kind of knowledge needed to thousands of new beginners who are about to commence fruit-growing in our young and favored state.

"My object in writing this is not so much to advocate the great want of such a society, or the amount of good that would be derived from it, as it is to try and devise a practical plan of organizing, under the adverse circumstances in which most of us are placed, scattered to all parts of the state, without money or other facilities of getting together at present to discuss and organize, as is usual in more favored communities. I propose that the editor of the Kansas Farmer act as our secretary; while we try the experiment of organizing, which I believe may be done in the following manner: Let every orchardist, fruit-grower, vine-dresser, gardener, nurseryman and amateur in the state who wishes to become a member of the society, send his name and post-office address, with 25 cents, to the editor, for assisting us in organizing, who will publish in the Kansas Farmer the names of those wishing to become members. From the published names let each member select his candidate for a president, vice-president, secretary, corresponding secretary, and treasurer, and send his vote to the editor. Let him count, and in the succeeding number of the Farmer announce the candidates elected, who shall serve as such for one year from the 10th day of January, 1867.

"It shall then become the duty of the secretary, with the assistance of the corresponding secretary, to prepare a constitution and by-laws, which should be drawn up with a view to strict equality in membership and economy in finances. Any member could offer in writing any suggestion in framing the constitution and by-laws. When such constitution is finished and submitted to and approved by all the officers-elect, and so announced through the Kansas Farmer, it shall be considered the valid constitution until an opportunity occurs to have it submitted to a vote of the members of the Society, and a majority of the whole vote shall adopt or reject the same. I think it would be well, in selecting the officers, to have all parts of the state represented. As the business would be principally done by correspondence, no inconvenience could arise from it, as 'Uncle Sam' will carry our letters 1,000 miles for the same price as one mile, and while stage and railroad-fare is so extravagant, we may find some pleasure in having a chat now and then on paper.

"Hoping the editor will consent to assist in organizing, I close by saying, let every one come promptly forward, as we are organizing in a work that interests all. The publishing of this article will be the watchword to act. Send in your names."

The above letter was written by William Tanner, and he was rightly chosen as the first President. The next year the name was changed to The Kansas State Horticultural Society, and for three years more William Tanner served faithfully and energetically as its President. To know how well Wil-

liam Tanner builded, one has now to look at the head of the great horticultural column. Kansas fruit is known and appreciated all over the civilized world. Kansas cannot afford to forget the name of William Tanner. Many less worthy men have had enduring monuments erected to their memory, but the living monument of fruitful orchards throughout this state will ever proclaim William Tanner as one of her noblest citizens.

J. W. BYRAM.

Born at Dayton, Ohio, August 26, 1825. Died in Oklahoma, April 11, 1894. He joined the State Horticultural Society in 1879, and was an active member to the last. Was always ready to take any part assigned him, or do any duty required of him for the good of the society.

Appropriate resolutions were passed, and a lengthy obituary was read at the twenty-eighth annual meeting.

ROBERT HAY.

Born ——, died at Junction City, Kas., December 8, 1895. He was long an active member of this Society. He read a paper on "Geology" at the Fort Scott meeting, in December, 1894, and at the time of his death was preparing a paper on "The Development of the West the Prosperity of the East," to be read at the approaching meeting at Lawrence. He was ready to add his mite to the last.

PROCEEDINGS
OF THE
TWENTY-EIGHTH ANNUAL MEETING,
Fort Scott, December 11-13, 1894.

Wednesday, December 11, 1894.

The Society was called to order by President L. Houk at 10 o'clock a. m., with a few appropriate remarks, and the appointment of the following committees:

On Credentials.—E. P. Diehl, W. T. Jackson, C. M. Irwin.

On Programme.—Samuel Reynolds, E. J. Holman, H. S. Coley.

On Membership.—H. J. Newberry, General Rice.

Resolutions.—C. M. Irwin, G. M. Munger, J. L. Treadway.

Obituary.—Samuel Reynolds, A. Willis.

Suggestions for Good of the Society.—G. W. Bailey, M. Allen, J. F. Cecil.

Constitution.—B. F. Smith, F. Wellhouse.

Addresses and Reports.—J. W. Robison, Francis Goble.

Exhibited Articles.—F. Holsinger, E. J. Holman.

Auditing Accounts.—R. Wellhouse, E. P. Diehl.

SECRETARY BRACKETT'S REPORT FOR 1894.

Mr. President and Members of the Kansas State Horticultural Society:

We assemble again as the representatives of the horticultural interests of Kansas, and our deliberations should be most thorough and guarded. Our sister states are also deeply interested in our work.

Eastern orchardists are looking with great favor on the valleys along the Arkansas, Kaw, and other rivers. These, with their subirrigation, yield as fine apples as the world ever saw. Their fertility develops size, and our sunny autumn brilliant coloring, maturation and most excellent quality. Thousands of fruit-trees are being planted in such localities by Eastern men, and the future will not disappoint their expectations.

I note a singular condition among apples this season, in some localities, largely confined to the Ben Davis, viz., abortive seeds. The apples attained large size, seemed sound externally, but on squeezing in the hand were found unsound internally; on cutting open, the core was found blackened, and in many cases not a seed had formed. Such apples are keeping badly, and packers are hurrying off their stock, in some instances at a loss. This condition, it is claimed by some writers and scientists, occurs through a weakened or debilitated pollen, which results from the attack of a fungus upon the flower.

Spraying.—This method of protecting our product has "come to stay," says

Professor Bailey, of New York, and is one of the admitted necessities for success. Its possibilities and the best methods of practice are not yet fully determined; but that it is a move in the right direction is a settled question. 'Tis true that it may not be needed in all years in all localities, but taking one year with another it has proven generally a great saving of marketable fruit throughout fruit-growing regions.

During the last year a new insecticide has been discovered, which promises to be a rival of Paris green, London purple, etc. It is known as "gypsine." As this matter properly belongs to the Committee on Entomology, I will drop it with this brief notice.

On motion, the following committee was appointed to secure rooms in the capitol for the use of the Society: F. Wellhouse, Topeka; E. J. Holman; Leavenworth; Edwin Taylor, Edwardsville.

On motion, the Secretary was ordered to move the office to capitol as soon as rooms are secured.

Adjourned to meet at 1:30 p. m.

AFTERNOON SESSION.

Wednesday, December 11, 1894.—1:30 p. m.

President Houk in the chair. The Treasurer's annual report for 1894 was then presented, as follows:

Dr.	Cr.
January 1, 1894, Board fund on hand	\$77 01
June 30, 1894, balance, from state.....	73 22
Memberships	4 00
Total	\$154 23
	Cr.
January 1, 1894, by Treasurer, traveling, stationery, post-	
office and notarial.....	\$28 70
June 30, Martin Allen, as per bill.....	26 50
November 18, Secretary Brackett, for postage on pro-	
grammes	4 00
Total	\$59 20
Balance in treasury, \$95.03.	

FRANK HOLSINGER, Treasurer.

On motion, the above report was referred to the Auditing Committee.

Next was taken up

ORCHARD CULTURE.—By E. J. Holman, Leavenworth.

Orchard culture means care of the tree from the nursery until cut away. The life of the tree and the profits of the orchard will be measured by the care given. This assertion we assume will be agreed to by all intelligent horticulturists. Our soils are nearly all good for tree-growth; the exceptions being worn-out, undrained and hard-pan soils. The first great requisite, after preparation of soil, is planting at proper distance apart, say from 30 to 48 feet each way. Nurserymen recommend close planting for protection, and the removal of alternate trees when they infringe to their injury; and large orchardists are cited as authority. But orchardists, can you give a small per cent. of close planters who have properly, and in time, thinned their trees? Our section is full of closely-planted orchards; the trees are stunted, dwarfed, gnarly, crowded and incapable of producing the best fruit.

To prove this, one has only to notice this year the increased drought-resisting power of trees with most room. Close planting has been the cry for years. But in view of ruined orchards and worthless fruit, and of thousands of younger orchards tending the same way, is it not the duty of horticultural writers, journals and societies to call a halt on close planting? Many orchards may yet be saved for years of profit, by vigorous thinning, judicious trimming, careful cultivation of the soil, applying ashes or other manures broadcast and harrowing in. The idea that a lone tree cannot protect itself against sun and wind is erroneous.

DISCUSSION.

F. Wellhouse: I plant closely one way, intending to cut out alternately when they interfere. A family orchard can be kept in good condition by frequent manuring; but this is impractical in a commercial orchard. I allow all weeds to grow among the trees and twice a year run a heavy rolling cutter over the land, breaking them down and chopping them up, thus making a fine mulch and enriching the land. An orchard planted in 1876, given this treatment, produced the finest crop in 1894, and the trees kept in good health. The land is good upland corn or wheat soil. I believe apple-trees are as long-lived in Kansas as elsewhere when properly cared for. Early decay is caused by excessive late fall growth. In 1894 our crop was quite free from codling-moth, but the "apple-cucurlio" was numerous and damaging. Spraying does not check them. Plowing among trees damages the surface roots. Better seed the land to red clover when trees are five or six years old. Red clover and alfalfa are nitrogenous plants, yielding much plant-food.

The President: Mr. Holman struck a vital point when he recommended liberal distance between trees. I planted 600 trees 20x20 feet, which fruited in 1886, and have been reasonably fruitful since, and yielded in 1894 a fine crop. These trees will soon have to be thinned. Wood-ashes are a valuable fertilizer, but are in limited supply.

F. Holsinger: My orchard has not been cultivated for 10 or 12 years. I last plowed it about six inches deep, and the result was a fine crop of fruit, free of insects. I first plowed as early in spring as possible, next, at the time the leaves opened, and across the first.

Mr. Saxe: In 1871 I planted an orchard of Ben Davis and Willow Twig, 30x30 feet; they bore fine crops for many years. Most of the Ben Davis are dead. The Willow Twig now crowd each other. Fifteen years ago I planted 135 Ben Davis and 125 Willow Twig and Genitan, 19x19 feet. Close planting yields more fruit per acre during first years of bearing. My land is prairie, sloping northeast. Kansas soil is rich in plant nutriment and organic matter; little nitrogen is needed until fruiting begins. Pear-trees do well mulched with corn-stalks, both in health and yield of fine fruit.

Jacob Faith: Wood-ashes are more valuable in an orchard than barn-yard manure. Willow Twig planted 20x20 feet will interlock quite young. Plant trees 30x15 feet, and cut out alternate ones when they interlock. This will leave them 30x30 feet.

Frank Goble: The Ben Davis is the best for commercial purposes. Its bark bursts near the ground. This variety should always be given the best location.

P. Moyer: The life of trees may be extended and the crop increased and improved by trenching or deep plowing before planting. Mulching encourages formation of surface roots, which are liable to injury during winter.

H. S. Coley: In 1870 I planted an orchard near Oswego, mainly of Ben Davis and Willow Twig. It grew well, and at the proper age the land was seeded to clover. Four years ago I moved to Oregon. On returning I found many trees were dead. The Willow Twig is most liable to blight. Pruning or no pruning, results have been the same.

W. T. Jackson: The death of some trees is caused by planting on hard-pan, and by drought. Bark-bursting is caused by too rapid and immature growth.

Samuel Reynolds: In 1858 I planted an orchard, composed mainly of Ben Davis, Winesap, and Dominie, and most of them are yet in good health and yielded well in 1894. The soil is commonly known as mulatto, with a porous subsoil. Thin upland will not endure drought. The finest trees and fruit are grown on bottom land.

J. W. Robison: Bark-bursting occurred in Illinois during the '50s, even on deep black soil; some trees died while others recovered. Such culture as is recommended for the destruction of canker-worm—that is deep plowing in late fall and winter—kept the trees healthy and improved the fruit. The Ben Davis suffers in western Kansas, as reported at this meeting. Experiments have proven that salt is not a fertilizer.

G. W. Van Orsdoll: Bark-bursting occurs on the north side of trees in orchards on red sandy soils.

F. Holsinger: At the annual meeting of the Missouri State Horticultural Society, after much discussion on varieties of apples preferable for commercial orchards, it was decided to still use Ben Davis, and when the trees fail to plant more of them. Judge Wellhouse says, "he has had 14 crops of apples in 15 years from his Ben Davis orchards, and that it is the most profitable variety."

An Iola gentleman: The Ben Davis is short-lived in some parts of Allen county. Four years ago I planted 400. One hundred of these I manured with 500 pounds of dry, well-rotted manure to each tree. The subsequent wood-growth was heavy and some trees blew over. In 1894 the crop was heavy, and twig-blight severe.

Prof. S. C. Mason: The Ben Davis, on thin, retentive soils, suffers from attacks of blight. Subsoiling is desirable for this variety.

COUNTY FRUIT REPORTS.

Note.—Reports from western counties were not as favorable as eastern, yet the crop was fair; apples set well and heavy rains developed and matured a fine crop. Small fruits, including grapes, were ruined by a late spring frost. The apple-tree root-louse has been injurious on the Missouri Pippin and Winesap. It is most prevalent on varieties which develop surface roots, Ben Davis and Missouri Pippin yielded the main crop.

President Houk: In Reno county, in the spring, the apple crop promised to be about normal. But the drought during the summer, and attacks of the codling-moth thinned it heavily. At maturity the fruit was quite large, but the crop small. The peach crop failed, but we were supplied from just south of us. Pears, excepting the Keiffer, failed. Plums of the Chickasaw family were of good size, but plum-gall fungus ruined many. Cherry and small fruits bore light crops. Some twig-blight occurred.

Samuel Reynolds: Apples produced about half a crop, free from scab and insect injuries; not half the crop was marketable; old Ben Davis trees bore a full crop. Peaches, none. Pears, a light crop. Small fruits—strawberries

half, raspberries two-thirds; blackberries and grapes set a full crop, but the latter was materially reduced by drought.

B. F. Smith: On bottom land the strawberry yielded one-third of a crop. Protected fields were not so injured.

M. Allen: The apple crop in Ellis county was light, and fruit small.

E. J. Holman: An average crop of fruit was produced in Leavenworth county. Small fruits suffered from drought but the prices were quite satisfactory. The cherry and grape crops were large. Rawle's Genet yielded immensely. The crop was materially injured by cracking.

Prof. S. C. Mason: Drought reduced the apple crop of Riley county excepting on bottom lands. The cherry crop was good. Grapes were cut by late spring frosts and autumn drought. Strawberries were a general failure; but where irrigated, the result was satisfactory.

G. W. Van Orsdoll: In Shawnee county the cherry and blackberry were good; raspberry not good.

F. Holsinger: Prices of fruit were best known for years. Apples were a full crop, excepting Lawver, McAfee, and Missouri Pippin, which failed in my locality; Gano, exhibited at the Missouri meeting, were fine. Plums were a phenominal crop. Pears, light, having been injured by spring frost. Cherry, good crop; the Montmorency medium and Wragg late are good sorts. Small fruits—drought cut short the strawberry, rust the raspberry, and frost the blackberry, currants failed, gooseberry crop immense. Grapes, good and fine quality. Prices were good excepting for grapes.

President: The apple crop along the Cottonwood river, in Chase county, was good.

A. Willis: In some parts of Franklin county the apple crop was good. Cherry good. Wood-growth good during early part of the season.

Prof. S. C. Mason: On the Arkansas bottom lands apples made a good crop.

E. P. Diehl: The Johnson county fruit crop was about as reported for Douglas county. Rawle's Genet bore full and did not crack; it is a fine variety.

W. J. Cook: I sold my apples in the orchard at \$2 per barrel. The Ben Davis and other good keepers mainly went abroad. Small fruit was only fair.

Prof. Robert Hay: In Lane county I found the irrigated orchards bearing well.

J. T. Treadway, Allen county: Apples were half a crop. Peaches, none. Plums (Wild Goose); grapes, and Early Harvest blackberries, good; raspberries, fair; strawberries, one-third of a crop.

L. M. Howard, Crawford county: All classes of fruit light.

H. S. Coley, Labette county: Apple crop light. Small fruits—strawberries full crop, others half a crop. The J. L. Williams's pear orchard failed.

C. M. Irwin, Sedgwick county: Apples light. Few peaches. Miner plums full crop. Grapes full, where not beaten with hail. Small fruits, light.

G. W. Bailey, Sumner county: Apples on lowlands fine, on upland poor, owing to drouth. The spring frosts ruined the pears. Peaches, plums and grapes, fair. Small fruits, light.

F. Holsinger: Keiffer pears in the Kansas City market brought the grower \$4 per bushel.

Adjourned.

SECOND DAY.

Morning session, December 12, 1894.

Called to order by the President.

ORCHARD CULTURE.—By Jacob Nixon, Kellogg.

Excessive drought has disastrously affected some orchards, and diminished the size, yield and quality of others. When the drought became severe I ran the wind-pump night and day, into the dead-furrows between the rows, opening small ditches to each tree. When the wind failed I used a horse-power to keep up the flow. It doubled the size on the irrigated trees, as compared with those not irrigated. Seventy Ben Davis apples made a heaping bushel. There is a healthy wood-growth, and plenty of fruit-buds for next season. For two weeks I have been letting on a full flow of water, getting the subsoil filled, as the rainfall is light. From my 24 years' experience in southern Kansas, should I start another orchard (or advise a beginner), I should put up an irrigation plant for dry seasons. Plow the ground deeply in 20-foot lands, preferably north and south. Then run a subsoil plow as deep in the dead-furrows as four or five horses could draw it. Cross-mark lightly every 20 feet. I say 20 feet, for every 20-foot orchard I have visited in southern Kansas has borne twice the apples that a 30- or 40-foot spaced orchard has, or can, under our blazing July and August sun. Thick planting shades the ground, and the trees protect each other from wind, and arrive at full bearing in 10 or 12 years. I would head low from the first year. Judiciously check the lower limbs if inclined to lead. This can be done so they may all be removed up to 3½ or 4 feet from the ground by the fourth or fifth year. I would plant first-class whole-root trees every time; the sooner a tree strikes its tap-root deep into the subsoil the better its chances of reimbursing its owner. Cultivate, and keep clean, and in July or August apply a mulch of hay, straw or coarse strawy manure. When the September rains come, throw this back between the rows to rot. Grow four or five hoed crops, then sow to buckwheat early, cut and harvest this by July 1, and sow again and let the pigs and chickens harvest this and tread down the haulm for a mulch. Let no one persuade you to plow your young bearing orchard in the fall, as it may receive a check fatal to its usefulness. Last but not least, train the limbs radially from the main stem, no two from the same point—a circular ladder of limbs it might be called, around the body.

DISCUSSION.

F. Holsinger: Trees on whole roots as propagated at some nurseries cannot be properly planted. I have seen thousands of such trees planted, their roots twisted in all shapes to get them into the ground. Those grown on root sections are preferable.

A. Willis: There is much ignorance of what are whole-root trees. I do not believe there is a farmer or orchardist in Kansas who can select whole-root trees from others.

Jacob Faith: This theory of whole roots is in the interest of nurserymen, and not planters.

J. W. Robison: This theory was so thoroughly exposed at the Winfield meeting by William Cutter, I thought the question settled, especially for those present there. (See vol. XIX, pp. 81, 82.)

A. Willis: I suggest the Society postpone discussing this question until the year 1900.

Prof. S. C. Mason: I don't consider this question settled, and it would be proper to consider it as developments occur.

A. H. Griesa: Evergreens planted with whole roots are not often successful. Lateral roots are more valuable than descending ones. Chestnut-trees need transplanting several times to be successful. Standard pears require whole-root propagation.

E. J. Holman: I move that this Society denounce the "whole-root" theory as a humbug, a delusion and a snare.

F. Wellhouse: I planted two rows each of Ben Davis, Missouri Pippin and Winesap on whole roots alongside a lot on root sections, and have never been able to discover a difference in them.

E. J. Holman: As Barnum once said, "American people love to be humbugged." Some nurserymen advocate whole roots because of the money in it. You cannot propagate apple stocks on a whole root. It is impractical.

A. Willis: Whole-root trees are only long piece roots. It is impossible for them to be anything else. I planted a lot of so-called whole-root grafts with a lot of piece-root grafts. They made a stronger growth the first year, but when two years old I could see no difference.

G. C. Brackett: I am opposed to the Society committing itself to the use of such ultra language as contained in this motion. It is not becoming to the dignity of such an organization. A simple expression of disapproval carries more influence, and is all the public requires.

Mr. Holman's motion prevailed.

The report on geology was here read by Prof. Robert Hay, of Junction City. (Not furnished for publication.)

IRRIGATION OF STRAWBERRIES.—By B. F. Smith, Lawrence.

The drouth last spring caused me to try an irrigation scheme of my own. About the 10th of May I saw that my plants and crop of young berries, nearly ready to ripen, were perishing for water. Getting prices on pipes and water down to suit me, I laid pipes on the ground through a two-acre berry patch. I used 400 feet of one inch and 300 feet of three-fourths-inch galvanized iron pipe. At intervals of 100 feet I placed faucets for three-fourths-inch hose. Two arms of the three-fourths-inch pipe lead from the main, 100 feet, with faucets, so that with 100 feet of hose I applied water to the entire patch. I let the water on the rows of berries from the end of the hose, a gallon to every 20 inches of row, thoroughly soaking the rows, but not the space between. This was done from 6 p. m. till 6 a. m., taking to go over the patch, 24 hours, the cost being 10 cents an hour. I used 17,000 gallons the first time, and 16,000 gallons a week later. Cost piping and hose, \$60; water, \$5; labor, \$4.80; total, \$69.80.

Without the water I would have gathered about 75 crates, with the water I marketed 225 crates. One hundred and fifty crates may be credited to my irrigation experiment. These at \$2.40 per crate gave me \$360, less cost as above, leaves \$290.20 for Kaw river water. Had I irrigated 10 days sooner, this berry patch would have yielded 400 to 500 crates. Owing to mulching between the rows, less water was required and longer intervals between applications. Twenty-four hours after first applying water, the enlarging of the berries was noticeable, and to the end of the season they grew large. This

test of applied irrigation is small to what I have in mind on my 40-acre berry farm.

SMALL FRUIT.—By J. F. Cecil, Topeka.

Strawberries.—Nothing contributes more to success than a proper selection of soil. All soils I have examined will yield some returns. All who wish this fruit for home use are justified in attempting to grow it on any plot at hand. But he who would produce for market must know the nature of his soil. In my experience a good quality of clay soil, with a red, reasonably porous sub-soil, yields best results. Plow eight inches, subsoil six or eight inches, put on 20 or 30 loads of well-rotted manure per acre, worked in near the surface, and you have a good starter for strawberries. None did so well for me this season as Parker-Earle, Warfield, and Wood, with Parker-Earle far ahead. With good culture, on suitable soil, it is certainly a grand variety; good in color and quality, fair size and enormously productive. My greatest objection to it is that it yields too few plants. With Warfield I displaced Crescent, and now, after four or five years, I am glad I did so, though disposed to think the Crescent a grand berry yet. Some succeed best with it. A careful fruit-grower near me still plants it more largely than any other. He finds it most profitable. Bederwood is a good early variety, but inclined to rust. The Gandy produced some good-sized berries, but not up to its former appearance. With me it never was productive enough to be profitable. I hardly feel justified in having said so much for Captain Jack. It has so seriously disappointed me the past three seasons that I am now disposed to trust it less. Barton and Robinson made good plant-growth, but were badly frosted, and I am unable to speak of their fruiting qualities. Bubach and Haverland disappointed me, but they have done so well in other seasons that I do not think of discarding them.

Raspberry-growing is truly hazardous. A few years ago the Souhegan and Gregg became unprofitable with me from the effects of anthracnose, but the Hopkins produced paying crops; now it, too, has succumbed to the same disease; then the Kansas appeared to revive courage, but after our drought the past few months I find abundant evidence of the disease. My observation and experience is that on heavy black soil and in shady orchards the only hope of raspberry culture for the next few years lies, unless remedies now being tried prove effectual in checking this disease. Cuthbert is the only red berry that I succeed with, and to make it profitable, the suckers must be treated as weeds, and only a limited number of canes left for fruiting. Shaeffer kills out to such an extent every year that it is not profitable.

In blackberry culture I have confined myself to two varieties—Snyder and Kittatinny. Of these, the Snyder has done best in bearing and profit, with good ground, culture and close pruning. The fruit is of good size and quality, and very productive. Without the above conditions it fruits the whole length, and the immature berries dry on its long canes. I cannot keep down the rust on Kittatinny. Have changed my stock four or five times, but invariably rust appears with the first year's growth. One grower in our county produces paying crops of fine berries of this variety, and has little if any rust; he claims nothing unusual in his methods. He vigorously uses his cultivator and hoe, and cuts out rust on first appearance. His soil and subsoil are very red clay. This I believe the secret of his success. I believe that yard manure applied to raspberries contributes to spread anthracnose, yet that no crop responds so heartily to liberal manuring as the strawberry.

Currants and gooseberries have done best on heavy black soil; though in very wet seasons I lost some fruit and plants from excessive moisture, where the subsoil is too firm. Fay's Prolific is about as good in growth of plant, and production as Red Dutch, and a better seller. The Downing gooseberry is as productive as the Houghton, and a better seller. Industry has produced no fruit for me, though I procured plants from two reliable sources and am sure I have them true. It dies from drought or cold and has not mildewed.

SMALL FRUITS (Northern District).—By Miss A. Bowman, Leavenworth.

Strawberries did not average half a crop. Old plantations yielded practically nothing, and new ones that came through the winter looking well did not make a fair yield, owing to dry weather. Warfield cannot stand dry weather. Bubach is a complete failure here; Captain Jack the same. Windsor Chief and Champion did not do well with us with Captain Jack for a fertilizer—too much imperfect fruit. Jessie had to go; this spring we put Bederwood in its place. Crescent, in spite of its detractors, will still continue to be planted. "Aroma," a new variety to us, stood the dry weather well, and brought its grower high prices in northern markets. The finest stand of berries we saw this season grew with B. F. Smith, at Lawrence, and was the Parker-Earle variety. Bederwood and Robinson also looked well. Mr. Smith carried his berries through the season by irrigating them, conducting the water through gas-pipe laid on top of the ground through the patch, so that by the aid of 190 feet of hose he could irrigate every part. The only fault we find with Parker-Earle is, few runners. We have heard that it does not give satisfaction in wet seasons. With just enough rain, two or three acres of Parker-Earle, near a good market, is capital indeed.

Currants and gooseberries paid well this year. Gooseberries at \$3 per bushel, and currants at \$4 per bushel, beat all other small-fruit returns.

Cherry-trees sprayed yielded well, but did not command very high prices, averaging only \$1.25 per crate.

Plums brought a good price and were a fair crop. Spraying paid in every instance. Wild Goose and Miner grew best in thickets.

Blackberry-canies were injured by dry weather and the depredations of an insect that stung them. Late frosts destroyed some plantations. Generally speaking, half a crop was harvested.

Raspberries were almost unknown.

Grapes were a full crop, and at times difficult to dispose of at a cent to a cent and a half a pound.

The fruit-growers will have to pattern after Judge Wellhouse, and plant apples, apples, apples.

Adjourned to 1:30 p. m.

AFTERNOON SESSION.

Thursday, December 12, 1894—1:30 p. m.

DISCUSSION ON SMALL FRUIT.

J. F. Cecil: Hopkins is my best raspberry.

Prof. S. C. Mason: Nemaha raspberry is not as large as Gregg, but preferable.

B. F. Smith: On my grounds the best varieties are Nemaha, Gregg, Kansas, and Hopkins. The best blackberry is Taylor.

C. B. Webster: In former years I was successful with strawberries, and have realized \$300 from three-fourths of an acre. Gregg does best in raspberries; Turner is too soft to handle safely. Gregg can be held 24 hours safely.

NOMENCLATURE AND NEW FRUITS.—By G. C. Brackett, Lawrence.

The confused nomenclature prevailing in portions of the state, caused by the introduction of trees and plants by ignorant and reckless tree-dealers, will require years of careful attention to correct; and so long as planters patronize such dealers, in preference to home nurseries with established character for reliability, they will suffer from gross imposition. I am forcibly impressed with the truth of this statement by receiving more specimens for identification during the past year than in any previous year. Action should be taken by nurserymen of the state whereby their catalogues would be made to conform to the correct list of the American Pomological Society, which seeks not only to correct errors in published lists, but also to remodel long and meaningless names to sensible orthography. Too many names have unnecessary handles attached for popular favor. Simplicity is desirable in all names relating to fruit.

Apples.—Manwaring No. 1 still maintains its reputation as the best autumn variety. The tree stands drought and extremes of winter. Manwaring No. 2 is one of the most beautiful fruits of late October and November; size, large; colors, soft yellow, brilliantly striped with red; flesh, yellowish, firm, juicy, rich; tree, vigorous, robust, hardy, and productive.

Plums.—A few seedlings, originated at Garden City, are highly promising for western Kansas. One, named Eureka, nearly round, medium size, about like Miner, a freestone with small seed, ripening in September, reported productive.

Small Fruits.—The raspberry seems to lead in valuable seedlings. As Professor Crozier says in his recent bulletin, "Raspberries of the United States:" "The Eastern states have produced the best early-ripening sorts, while the Western lead in large size and fine quality." Emmett, a red variety, fruited in Douglas county for several years, has established a character entitled to the attention of planters; an offspring of the Cuthbert. The plant is hardy and adapted to the location where originated. It is not as robust as the parent, but is hardier and more fruitful. Berry, medium to large, with firmness to endure handling and shipping. It is attractive in the box and crate; quality equal to the parent. This variety has not been tested outside the grounds of the originator. These notes were made from examination in 1894. There are others reported to me as promising. Some have been placed in charge of experiment stations, and if valuable will be introduced in the near future.

Blackberries.—Claimants in this class are many. Of those fruited with me only one has proven a rival of Kittatinny. This is a seedling from Crawford county. It is robust, hardy, and productive, of the Kittatinny type, large, glossy black; a rich fruit, ripening evenly. I am informed it has not been named or offered to the public.

Strawberries.—Several sorts originating at Leavenworth are passing through a test at experiment stations, and indicate qualities which, if maintained, will make them valuable.

Grapes.—Seedlings at Onaga and Sterling are promising.

ELECTION OF OFFICERS.

President—Fred. Wellhouse, Topeka.

Vice-President—J. W. Robison, El Dorado.

Secretary—Edwin Taylor, Edwardsville.

Treasurer—Frank Holsinger, Rosedale.

Trustee for Southern District—G. W. Bailey, Wellington.

DISCUSSION ON INSECTS.

F. Holsinger: The root-louse has its season. It may be prevalent in our orchards for years, and then disappear. This has happened in my orchard and that of N. P. Deming, at Lawrence.

J. W. Robison: I do not agree with Mr. Holsinger, as we have suffered from root-louse for years. True, it comes and goes, as does the canker-worm. It is most frequently found on surface roots.

J. C. Evans: Root-rot, wooly-aphis, crown-borer and oak-tree grub will in time kill the trees they attack. They prevail in Kansas and Missouri.

J. W. Robison: Root-rot begins low down on the roots.

L. A. Goodman: Root-rot is pronounced by Professor Galloway's assistant in the agricultural department at Washington as contagious, and should be carefully watched to prevent it spreading.

J. C. Evans: I believe drought will kill Ben Davis when not properly cultivated.

On motion, the Society accepted invitation to visit the Hart Pioneer Nursery next morning.

Adjourned to 7 p. m.

EVENING SESSION.

President Houk called the Society to order, and a paper was read as follows:

ADORNMENT OF HOME SURROUNDINGS.—Mrs. M. J. Coventry, Fort Scott.

Our Heavenly Father might have made this world endurable as a place of probation without so much beauty as we behold scattered with a lavish hand; without the rainbow-tints and exquisite shading of colors; without the delightfully sweet perfumes of the violet, the heliotrope, the rose, the hyacinth, and others of the bright sisterhood of flowers. But the exhibitions of His love would have been fewer and the incentive to look from Nature up to Nature's God less. There are few people who do not love the flower-garden. No work is so refining and ennobling as cultivating flowers and fruit. In reading the lives of great men who have lived we find they spent much time indulging those esthetic tastes which elevate the mind, refine and purify the life and ennable the soul. It was in the garden, surrounded by those gorgeous, sweet refiners of Nature, that the thoughts were penned that immortalized them.

Every family in Kansas, on farm, in village, or city, should reserve a spot near the dwelling for flowers. To be loved the home must be beautiful and worthy of being cherished. The neatest and happiest homes are those adorned with well-cultivated flowers, and the price of suburban residences of cities lies often in the floral beauties of their gardens. The culture of these beauties of Nature tends to virtue, refinement and intelligence, while

the lack of it often leads to vice, immorality and estrangement of family. Every child should have a flower-bed of its own, to cultivate and care for as it wishes; allowed to choose the varieties and to pluck the blossoms at pleasure. With a share of these cheering and beautifying emblems of innocence and purity, their souls will be taught God's love to man.

Flowers refine; dross becomes as pure gold. Under the influence of their charm, evil vanishes. Good predominates wherever their cultivation is manifest. They add a charm to domestic life which nothing else can impart. They bring happiness and content. Desolation is marked by rank grasses and tangled weeds.

It does not require the fortune of an Astor to possess these blessings. It is a pleasure that is as free to the common laborer as to the merchant-prince. Make home cheerful with books and flowers, and the boys and girls will want to stay. When they grow to maturity and battle with life's vicissitudes they will often look back to their childhood homes, and as memory travels apace, the sweetest picture it will recall, the one on which it will linger longest, will be the little flower-garden—the brightest vision inscribed on memory. Therefore, friends, we plead with you to plant trees and flowers and cultivate the beautiful about the home, the schoolhouse, the church, in the village, in the city, on the farm.

One plea is, no time. When the farmer used a wooden mold-board plow, sowed grain by hand and reaped with a sickle, there seemed to be some excuse, but now machinery relieves the greater burdens of the farm—there is no excuse.

Some ask, "Will it pay?" Yes, indeed. A residence surrounded by a well-kept lawn, on which are tall, graceful trees, will sell for hundreds of dollars more than a place which stands out alone in the glaring sun all the long summer day.

An orchard increases \$1 every year for each apple-tree. If 500 trees are planted, \$500 each year is added to the value of a farm. Then what would a farm be worth for comfort or pleasure without an orchard? It cannot be urged too strongly on the farmers of Kansas to plant large orchards, which will yield a hundredfold in health, pleasure, and profit. This work is but cleverly commenced.

Large groves should be planted on every farm. Every one owning 160 acres can well spare 10 or 20 acres for woodland. It would not only enhance the value of his own land but that of all the country. Suppose there were 10 acres of every quarter-section in the state a fine woodland. In a few years we would not hear of the rain-belt in Kansas. Every Kansan knows the climate of the state has been irregular since its settlement, and that the greatest embarrassment of the horticulturist has arisen from the extremes of temperature and moisture. If we believe the testimony of the wood-growth, we find this same irregularity for the last 150 years. There have been periods of drought and disaster, also periods of remarkable fertility, before the advent of the white man. Such is the testimony of the forests. As the geologist reads the history of the earth in the rocks, it is the privilege of the horticulturist to read the history of the vegetable growth and consequence of climate in the records of the forests.

As horticulturists it will be an act of wisdom to accept the lesson gathered from Nature. In regard to Kansas, and probably the entire Missouri valley, this lesson will be of vast moment. While we know that our climate for the past 25 years has been irregular, we are taught that this is not exceptional,

but has characterized this region for at least a century, and to counteract the effects of climate is now and ever will be an important and difficult work. We need the means to counteract the effects of these irregularities of temperature, moisture, and wind. I believe in the possibility of converting most of the Western plains into practical farming condition by planting large orchards and forests, which help to retain moisture and check hot winds which carry desolation in their path. If cutting away forests decreases rainfall, planting forests will increase it.

To you who have done so much for the state of Kansas, we give thanks for the work done in reclaiming and beautifying the treeless plains. Go on in the undertaking until trees are planted along the streets and avenues of every city, around every schoolhouse and dwelling. Trees are objects of beauty. They refresh us by their shade, sustain us by their fruit, and protect us from the fury of the elements. Forests temper the heat of summer and the cold of winter, restrain the fury of winds and regulate and equalize the distribution of rainfall. Without the present forests of the world and the fossilized remains of those of past ages the busy wheels of the thousand industries of civilization would stop, and the earth become a dreary waste. The cultivation of trees is to-day of vital interest to Kansas, and if this great and grand state is to continue its growth and prosperity that renders her name a household word and her territory a land of promise to the immigrant, it must receive the fostering care and aid of all her people.

Gentlemen, go and do your part in this, not only for your own home, but plead with your neighbor in behalf of this great work.

DISCUSSION.

President: A near neighbor received a lot of Colorado blue spruce evergreens, about two feet high; set them in the ground, leaving only one foot out. These trees are now symmetrical in form.

E. P. Diehl: Black-walnut trees only 27 years of age have been sold for \$1,000 per acre. A lot were recently shipped to London.

Prof. S. C. Mason: Kansas grown black-walnut trees have a much harder and firmer grain than any grown elsewhere; hence, are more valuable.

W. T. Jackson: Every member should zealously work for the adorning of their school-grounds and the punishment by law of persons willfully injuring street trees.

L. A. Goodman: There is nothing more interesting to me than growing beautiful trees on a farm and in the yard. Evergreens, shrubs and lawn-trees should form their tops from the ground up, and we should assist them only as required to make perfect forms. They should not be closely planted. The practice of sawing off large branches of street trees should be condemned. Rear trees that are typical of the variety.

J. W. Robison: A home adorned with shrubs and flowers and well-kept lawns, with climbers over the verandas and trellises, is a home of beauty and pleasant to look upon.

President: I emphasize the point made by Mr. Goodman, viz., the mutilating and deforming trees to fanciful shapes, as globes, etc., without taste or beauty. Nature's tree-forms are what should be aimed at in ornamentals. A fine plantation, once mine, became city property. A professional gardener (?) was employed to shape the trees into palmetto and other oriental forms. Result, they died.

A. Willis: We should first learn the nature of the tree, and then work in

harmony with it. Such was the practice of S. T. Kelsey while in charge of the university grounds at Ottawa, and they are rivaled by no others in Ottawa. If a quick shade is required, plant cottonwood as a nurse tree for the more desirable ones. Lawns are beautiful as home surroundings. They are an ornament during the growing season. Attachment for home depends largely upon its attractiveness, and when the home is beautiful it will cheer and make happy our declining years.

Samuel Reynolds: I reside in a city where all streets are shaded and embowered with lovely trees, and in summer the appearance is most beautiful.

J. C. Evans: Referring to the excellent paper of Mrs. Coventry, I feel that a copy of it should be in every schoolhouse and published in all our public journals.

On motion, the Society tendered the essayist its unanimous thanks.

Adjourned to 10 a. m., to-morrow.

THIRD DAY.

Morning session, December 13, 1894—10 a. m.

The President called the Society to order, and "Vegetable Gardening" was discussed.

F. Holsinger: As celery must have abundance of water, and the season was dry, I irrigated mine, with the help of a three horse-power engine, drawing the water from a near-by creek, and forcing it through conductors on to the land. The result was very satisfactory. I set the plants four inches apart, in rows four feet apart, cultivated thoroughly and deeply, turning the earth to the rows and banking on the plants. For final bleaching I packed the grown plants in double rows with only two inches space between them, which space I filled with earth, then mounded up to near the top. On the approach of freezing weather, I covered the entire tops with stable-litter. The great hindrance is, the difficulty in starting and growing the plants from seed.

W. T. Jackson: I am confident as fine celery may be grown in Kansas as anywhere.

E. J. Holman: For bleaching celery I find tree-protectors excellent. They cost \$2 per 1,000, and by keeping them dry they will last for years.

A. Willis: I consider cabbage an important vegetable for family and market purposes. It is scarce during late fall and winter. The cause of this should be investigated by gardeners.

E. J. Holman: Early varieties can easily be grown. The scarcity of later ones is due to dry weather in July and August and the attacks of worms.

F. Holsinger: To kill cabbage-worms, Professor Whitney successfully uses hot water, sprinkled on the plants. To prevent the heads bursting, loosen the roots by gently lifting the plants.

Prof. E. A. Popenoe: Kerosene emulsion is no better than hot water for destroying cabbage-worms.

E. P. Diehl: Pyrethrum is a good destroyer of cabbage-worms.

GENERAL REMARKS.

B. F. Smith: On June 1 I planted an old strawberry bed with sweet potatoes, and they yielded at the rate of 400 bushels per acre, and were of excellent quality.

Prof. E. A. Popenoe: The parsnip is one of our best vegetables, and salsify is worthy of culture.

President: Okra is full of starch, and very wholesome.

E. J. Holman: Sea-kale, another good vegetable, is perennial, and will propagate from pieces of its roots.

APPLE-BARRELS.

Samuel Reynolds: It is time that legislation is had to determine a uniform size for apple-barrels for this state.

F. Wellhouse: We have used a three-bushel barrel for 15 years.

F. Goble: I have used barrels that hold 11 pecks and others over 12 pecks.

J W. Robison: Barrels vary, owing to difference in cutting the chime and using staves varying in thickness. Apples vary in weight, according to variety. The Yellow Bellflower weighs 50 pounds and Gilpin 56 pounds per bushel.

Colonel and Mrs. U. B. Pearsall here invited the Society to an informal reception at their residence this evening, which was accepted; time, 9:30 p. m.

Adjourned to 1:30 p. m.

AFTERNOON SESSION.

December 13, 1894—1:30 p. m.

The Society was called to order by the President, and a paper on "Experimental Horticulture" was read by Prof. S. C. Mason, of the State Agricultural College.

SPRAYING AND ITS RESULTS.

F. Wellhouse: I am still successfully using London purple and Paris green as insecticides. In 1886 we were compelled to spray to exterminate canker-worms, then prevalent in our orchards. This work cleaned out all classes of caterpillars. The codling-moth were also nearly exterminated. Have sprayed each year since. Jonathan trees sprayed each year during the past four years have not blighted. They frequently blighted before we began spraying.

FUNGICIDES.—By James Kane, Lawrence.

Bad weather and lack of time prevented our spraying thoroughly, so we cannot make a full report as desired.

Apples.—Sprayed once with Bordeaux mixture, half strength, with four ounces of Paris green to 45 gallons of mixture. As an insecticide this proved too strong, much foliage being scorched. Peach, growing in same row with apple, sprayed with same mixture at same time, and not a leaf was affected. More lime was added, with no bad results. Fruit free from scab, but badly damaged by curculio and codling-moth.

Quinces.—Sprayed three times with Bordeaux mixture to check leaf-spot. In former years this fungus ate the leaves so badly that many of them fell off during the growing season. This year scarcely any spots; foliage healthy color, hung on until frost.

Vineyards—Sprayed twice with Bordeaux mixture, twice with ammoniacal solution of carbonate of copper. First time three ounces Paris green to 45 gallons of mixture. Second time 4½ ounces Paris green to 45 gallons, when berries were about half-grown; our aim being to destroy fidia. This insect

has been very destructive in our vineyard for years. A close watch was kept for several days after spraying for dead bugs; few were found, but their numbers lessened perceptably. They will not feed on leaves coated with lime-mixtures. Poisons without lime we believe would be more effectual. No mildew or anthracnose were seen this year. Considerable black-rot on leaf and fruit in a portion of the vineyard. Vines free from fidia made a good growth; foliage healthy and clean, hanging on until killed by frost.

Senator Dillard, of Fort Scott, addressed the Society on its work, and assured its members that he would assist in any legislation promotive of the interests of Kansas horticulture.

Mr. Robison, on behalf of the Society, stated that it needed suitable rooms in the state capitol, and an appropriation under its control for publishing the reports immediately after the annual meeting.

FORESTRY.—By E. D. Wheeler, State Forestry Commissioner.

Mr. President, and members of the Kansas State Horticultural Society: I presume that you expect a report of the condition, prospects and possibilities of forestry interests in Kansas. Your programme may have led some to expect a long report of this department. The report is now in the hands of the printer, and I hope to send a copy to this Society within a short time.

The interest your Society shows in forestry indicates you are safe counsellors. The advancement of our state in horticultural lines is evidence not only of ability and disinterested effort, but also of the importance of organization. I am here to call attention to the fact that the time is rapidly approaching when not only Kansans but Americans will have to consider forest-planting, management and preservation. Within two years millions of acres have been destroyed by fire. At no time in our history has the attention of our citizens been draw so strongly in that direction. Destruction in the North and drought on the plains are arousing to action. Forestry is becoming a question of the hour.

Floods dashing to the sea, carrying destruction, death, desolation and ruin, call to memory the time when Nature's reservoirs covered mountain and hillside, holding for future use in the ground litter and granular soil, the life of vegetation. In the valley of the Mississippi, and beyond, people irrigate their gardens and orchards. France to-day is spending millions to reforest her hills and mountains denuded to support the wars of Napoleon. Germany glories in her forests, which modify her climate, prevent floods, increase the humidity, and also produce a revenue. For 100 years they have been investigating the laws of Nature relating to forest influence on rainfall, and have proven beyond doubt that forests increase rainfall. Austria and other nations have demonstrated the same results, while investigations in India are still more convincing.

The immediate dangers threatening the forests of Kansas and the Mississippi valley are live stock and the ax. We must try to prevent mistakes in the management of our forests, and encourage our citizens to plant such trees as in their location will produce a profitable growth of timber. A forest once destroyed can hardly be replaced in a lifetime. The mismanaged forests of eastern Kansas, largely composed of worthless varieties, and the treeless plains of western Kansas appeal to our philanthropy. Here and there they are using irrigation plants and little belts of timber, to stay until they conquer.

In the past year the interests of forestry have so increased that many de-

sire to unite the friends of forestry in a state association. At the Hutchinson irrigation convention we secured the appointment of a committee to arrange plans and a date of organization. They will likely report soon. Several of your members are in the lead in this movement, and it is hoped many more will join us whose influence will be felt in every township in the state, and the support of our forestry department will place it on a high plane of usefulness. I see no reason why we may not co-operate with the national forestry association and be mutually benefited.

FORESTRY.--By J. B. Schlichter, Sterling.

All kinds of trees have suffered severely during the past two years. Many show signs of decay, and many have died. This condition exists particularly in plantations where trees have attained such age and size that cultivation has been discontinued. Younger plantations, where thorough cultivation has been given are thrifty and healthy.

In some of the older orchards many trees show signs of decay. This is more noticeable in Ben Davis and Winesap. Three of my largest Ben Davis died this summer. In one orchard one row of Ben Davis died. In another orchard the trees were planted close, and had to be thinned out, and it was discovered that many trees were rotten at the heart.

Of forest-trees, the catalpa speciosa stands the severity of our summer drought the best; next the Russian mulberry and ailanthus. Many box-elders are dying in the upper tops. Cottonwood on bottom land and light sand holds out well, but on heavy clay and high upland is dying out. Honey-locust endures well, but black locust is injured by borers. It is but four years since the borer made its first appearance, and already there is not a tree that has escaped its ravages. I have many trees that will make four to six good fence-posts; some will make eight to 10 posts. The black walnut does well, but within the past two or three years many have died, and others are showing decay.

With my experience and observation, were I to make another plantation of forest-trees it would be of following varieties: Catalpa speciosa, ailanthus, Russian mulberry, elm, honey-locust and walnut, and would prefer them in the order named.

The cottonwood has been a source of revenue to me the last two years in fire-wood, yet I would not recommend planting it as a tree of value; because of its rapid growth it may be planted to serve as a temporary windbreak. A row of cottonwood trees, planted one rod apart, 30 or 40 feet high, averaging a foot in diameter on the stump, will sap all moisture from the soil for two rods on either side, so that no crop can be matured within that distance of the trees.

I had 100 cords of 12-inch wood cut on my place last winter, which sold for \$1.25 to \$1.50 per cord on the ground. The trees had possession of the ground for 15 years, and averaged nearly a cord each. The ground was planted to corn and potatoes. The latter were an entire failure, the former made a partial crop. I believe there will be five years' grubbing among stumps before the land can be well cultivated.

Last August I made a trip to the western part of this state. Among other places visited Garfield, to inspect the experimental forest planted by the Atchison, Topeka & Santa Fe Railroad Company in 1874 and 1875. I name 10 varieties that have survived and appear to have succeeded best in the order named: Honey-locust, ailanthus, elm, box-elder, black locust, maple, cottonwood,

black walnut, catalpa bignonioides (there were no speciosa planted), ash. The last three named were almost entirely worthless. Ash was ruined by borers and walnut were nearly all dead. The plantation is on rich Arkansas bottom, about a mile from the river.

DISCUSSION.

J. W. Robison: The list of forest-trees given is a good one. I wish to add Kentucky coffee and honey-locust, which are successfully grown in my locality. The seed of the latter is scattered in cattle-droppings through their eating the pods. Black locust makes a fine growth in Butler county. The tops should be cut off at the ground the spring they are one year old. This will encourage a vigorous growth, to form the trunk of the future tree. Trees of this species make fence-posts at five years of age, and sell at 10 to 12½ cents each, while oak posts sell at 6 to 7 cents. They are more durable than Osage posts (?). The black locust throws a mass of sprouts, forming a dense wind-break. The Russian olive (?) is also a vigorous grower.

Prof. E. A. Popenoe: The so-called Russian olive is not an olive. It belongs to the buffalo-berry family. Kentucky coffee-nut seed should be scalded to hasten germination.

President: We should encourage the culture of the new Japanese walnut. It has a large attractive leaf, and the kernels are as good as the Maderia nut. The shell is quite hard.

NOVELTIES IN NURSERY TRADE.—By E. J. Holman, Leavenworth.

Novelties in the nursery trade proper are few, as the honest nurseryman feels it incumbent upon him to know by trial the merit of any new thing before he introduces it to the public.

Although novelties are offered without number, yet it is mainly by irresponsible and unrepresentative tree-agents. Such novelties as a rule are introduced for self. One of the latest is the peach swindler, representing to the people impossible characteristics, securing sales at extravagant prices, yet delivering ordinary varieties.

Of real novelties now being disseminated, we name the Crosby peach. It is too soon for a practical confirmation of its hardiness. Introduced by Mr. Hale, president of the American Nurserymen, after giving him crops when all others failed through frost, others having the same experience, it is a novelty that commends itself to every intelligent horticulturist. Another novelty that has come to stay is Moore's Diamond grape. A novelty on first introduction should be shunned except by those who can afford to lose money, as 99 per cent. of novelties prove failures. The eagerness of Americans for something superior leads them, without study, to jump at anything new. Such encouragement creates and supports novelty frauds. Novelties commanding themselves are Japan plums and Japan walnuts and chestnuts. To us in the West any kind of a chestnut is a novelty, yet this is adapted to a large portion of our state. Few trees promise such profitable investment. Its valuable timber, salable nuts, long life and ever-increasing production should give it favorable consideration to every landowner.

DISCUSSION.

E. J. Holman: The American chestnut succeeds with me; I have trees 30 to 50 feet high which are fruitful. Some commence bearing at seven to eight years. They are bisexual.

F. Wellhouse: I have been informed that the chestnut will grow on limestone land; Mr. Holman's trees are on sandstone land.

F. Holsinger: There are about 200 trees on Mr. Goodman's farm at Westport, Mo. Some are blighting, but mine are fruitful.

President: Chestnut wood lasts until worn out.

J. W. Robison: While residing in Illinois I planted 100 trees, and only 10 or 12 are now living; but these are fruitful.

A resolution to locate the Secretary's office at the capitol was adopted.

Adjourned to 7 p. m.

EVENING SESSION.

Friday, December 13, 1894—7 p. m.

President in chair.

HANDLING FRUITS.—By B. F. Smith, Lawrence.

By improper handling many men make a failure of fruit-growing. No matter how large or well grown fruit may be, if put on the market in an unattractive condition the grower fails to realize a deserved price. Handling begins in the tree or patch. If carelessly picked and dropped in a distant basket, it is bruised and will not keep as long as if laid in with the hand.

For picking half-bushel drop-handle baskets are good. They should be lined with sacking or canvas, so the fruit may not be bruised. The package for shipping all fruits should be neat and uniform in size, and neatly stenciled with the grower's address. All small fruit should be more carefully handled than eggs, nicely placed in new, clean, well-made boxes and crates. Fine berries packed in old weather-worn crates, slovenly marked, often sell for less than their real value. The most careful berry-pickers are females; they handle the berries well if once shown how. Noisy berry-pickers are a nuisance. The berries they handle and don't put in their mouths are a damage to the well-handled berries. Send such home as soon as found.

Orchard fruits and berries should be hauled in spring-wagons. I have seen hundreds of loads of fine apples on the Lawrence market badly bruised from being hauled in farm-wagons. For this reason many shippers buy and barrel in the orchard.

The report of Auditing Committee was here presented, and is as follows:

We, your committee, having carefully examined the financial reports of the Secretary and Treasurer, find them correct.

F. WELLHOUSE,

E. P. DIEHL,

Committee.

VINEYARDS.—By Wm. Cutter, Junction City.

Grapes wintered well, in spite of a few days of 20 degrees below zero. Spring opened early and warm, and tender varieties had to be uncovered by March 1. Although the grape is one of the easiest fruits to grow, even in the North, yet I lay down and cover all my tender varieties.

The dry season made small size and poor flavor, but it prevented rot. Of 60 bearing varieties we find Concord the best in its season; Telegraph best early; Worden best ripening between them; Moore's Diamond, and M. O. Risling, best white; Woodruff the most promising red. Of promising new grapes, Campbell's Early—not yet for sale—Carman, a late variety, Brilliant and Croton, are entitled to notice. Scientific pruning is not essential.

There is an increased demand for vines, and ere long every wise farmer will have an abundance of grapes for his home use.

GRAPE CULTURE.—By Peter Moyer, Fort Scott.

Preparation.—The land should be trenched 18 to 24 inches deep. A good fertilizer, such as bones, partly-decayed wood, etc., should be put in bottom of the trenches. In filling put the poorest subsoil on top to prevent surface roots.

Stock.—Select two-year-old plants, and plant six feet apart in rows eight feet apart, preferably north and south. Cultivate well; it pays. Trellises should be so arranged as to have the foliage cover the fruit, protecting it from rain and summer sun. This is best done by placing the wires in a triangular manner. I prefer trellises of wood not over four feet high.

Prune while the sap is down. Close pruning insures better quality, leave one to three eyes to each last year's spur. Summer prune directly after the bloom falls; "tip" the vine at the joint above the last cluster set. Thin out the weak shoots; keep well ventilated below. A pint of unleached wood ashes at base of vine is the best stimulant I have found, and it also repels insects.

Adherence to these rules has in the past 12 years given me bountiful crops each year with no mildew, black-rot, birds-eye rot or any withered by drought.

VARIETIES OF GRAPES.—By E. P. Fisher, Sterling.

I am testing 60 varieties, and will classify them: In first class I will place, as hardy, vigorous and productive, Worden, Concord, Moore's Early, Telegraph, Jewell, Champion, Martha, Niagara, Pocklington, Early Victor, Eaton, Etta, Antoinette, Isabella, Victoria, Jessica, Green Mountain, Moyer, Ives, and Catawba. Fine table varieties: Diamond, Berkman's, Jefferson, Delaware, Willis, Oriental, Witt, Mills, Empire State, Ulster Prolific, Vergennes, Duchess, Prentiss, Triumph, Lindley, Goethe, Newton, and Brighton.

I have following new kinds to fruit next season: Geneva, Rockwood, Esther, Eaton, Ozark, White's Northern Muscat, Early Ohio, Carman, and Colrain. I have several seedlings of my own. I especially recommend Victoria as a late white grape; also Etta (very late), quality excellent. If Ozark does as well next season as this I shall consider it a great acquisition. It is said to be very late, good size and good quality. I am pleased with Worden; it is larger and better than Concord, but no earlier here. Its fault is poor shipping quality. Brighton is a sure and abundant bearer (if protected in winter) of fine quality.

The best keepers and shippers are Mills (black), Duchess (white), and Vergennes. Red Catawba and Jefferson are good keepers and shippers. Worden and Berkman's seem deficient in firmness. Telegraph is inclined to overbear. I picked ripe Jewell July 21, and Etta were not all ripe when struck by frost, October 8. Etta is reliable, good bearer and the best late white. Moyer is a small red grape, of excellent quality, ripening with Moore's Early. Herbert, Wilder and Iona are fine grapes, and will succeed here with a little winter protection. The Wilder is probably the best.

DISCUSSION ON GRAPES.

Prof. S. C. Mason: El Dorado and Lady are good varieties, but each requires winter protection. I have not observed a lack of pollinating power.

F. Holsinger: Moore's Early, Champion, Concord, Goethe and Worden are

all the varieties needed. I see no use of a long list as mentioned. I would plant no white variety, they do not sell as well as Concord. For profit, Concord, Champion and Worden cannot be surpassed.

Prof. S. C. Mason: I would reluctantly offer Champion to a visiting friend.

President: Major Holsinger treats his friends with such varieties as Goethe and Martha.

B. F. Smith: We should all try new sorts as they are offered. By so doing we may find varieties better than we are growing.

President: I would prefer Rochester, if confined to one variety other than Concord. It is a very fine table sort, handsome, ranking next the Delaware in flavor. The vine always strong and vigorous with me. Francis B. Hays ranks next. Etta is worthy our culture; is a heavy bearer and nice for table use.

E. J. Holman: Ives is a profitable sort.

DISCUSSION ON SMALL FRUITS.

B. F. Smith: As novelties I tried Paris, King and Timbrell strawberries, and am disappointed in them. Princeton will, I think, prove a valuable late sort; the plant is fairly strong. I recommend it for trial only. Columbia is a good-flavored variety, and fairly productive.

President: This variety was found in Tennessee by an elderly colored lady, who transplanted and cultivated it until she had several acres, which she sold for a large sum. She was once offered 50 bales of cotton.

WEATHER REPORT.—T. B. Jennings, Government Weather Bureau, Topeka.

1893.—October: Dry, warm, sunny. November: Normal, dry. December: Unusually warm and dry.

1894.—January: Unusually warm; moist in southeast, dry in balance of state. February: Coldest in history of state; moist. March: First 20 days excessively warm; last 10 days cold, dry and windy, injuring much fruit. April: Warm, dry; general rain second and fourth weeks, third week dry and cold; hard on gardens. May: First week warm rain; second week strawberries in southern counties; fruit doing very well; balance of month dry. June: Warm and wet, but low night temperature detrimental to fruit. July: First week the rains were less frequent, and by the last week the month became so intensely hot and dry on into August as to nearly destroy fruit prospects for the year. Grapes wilted, tomatoes peeled in the sun, apples ceased to grow and fell rapidly. September: Rain and relief; apples ceased falling, but the crop was practically made.

Charts were furnished, illustrating the rainfall and temperature, but cannot be published.

REPORT ON EXHIBITS.

We, your committee, find on exhibition;

By the Kelsey Nursery Company, of St. Joseph, Mo.—Huntsman, Gano, Ben Davis, Willow Twig, Rawle's Genet and Romanite apples.

By J. B. Buckmaster, Fort Scott, and Francis Goble, Leavenworth, each Ben Davis apples.

W. J. Cook, Johnson county.—Plate of Minkler apples.

F. Holsinger, Wyandotte county.—York Imperial and Winter May apples.

E. J. Holman, Leavenworth.—Ben Davis seedlings and celery.

Jacob Faith, Missouri.—Bottle of unfermented grape-juice, in excellent condition.

C. H. Longstreth, Kearny county.—Display of fine apples, grown by irrigation.

J. P. Treadwell, Allen county, and J. J. Measer, Reno county, each a collection of apples.

F. HOLINGER,

E. J. HOLMAN,

Committee.

CONCLUSION.

Resolutions of thanks were passed to the retiring President and Secretary for their able and willing services rendered during a long series of years; to the citizens of Fort Scott for hospitality and courtesies rendered; to the Kansas City, Fort Scott & Memphis railroad for transportation courtesies; to the Hart Pioneer Nurseries for a pleasant excursion; and to the press for excellent reports and fair treatment.

The time for closing having fully arrived, the President offered a few appropriate and encouraging remarks on the success of this, the twenty-eighth annual meeting of the Kansas State Horticultural Society, after which the meeting was adjourned sine die.

The members spent the evening at an informal reception at the residence of Colonel and Mrs. U. B. Pearsall.

PROCEEDINGS
OF THE
TWENTY-NINTH ANNUAL MEETING,
Lawrence, December 10-12, 1895.

Tuesday morning, December 10, 1895—10:40 o'clock.

Called to order by the President.

Prayer by Rev. J. W. Summerville.

Committees were appointed as follows:

On Credentials.—E. P. Diehl, Samuel Reynolds, and William Cutter.

On Programme.—B. F. Smith, L. Houk, and G. W. Bailey.

REPORTS ON ORCHARDS.—F. Holsinger, Wyandotte county.

Last year was phenomenal in our orchards in production. The crop was large, and prices uniformly low. Apples now are a good price, and those who have held them may be thankful. The season was exceedingly wet with us, and apples matured well. The Ben Davis did not keep up its high character for bearing. The Winesap gives the best results. Willow Twig and other early apples uniformly bore well; but summer apples were a drug on the market, and there was little money in them. This was also true of fall apples. It is a grateful surprise that we are now getting better prices for apples than at this time last year. I think this largely due to the large quantity of apples put in cold storage. Strawberries were a short crop with me from dry weather. Raspberries and blackberries ripened after the rains commenced, and gave us a large crop. They sold at low prices. Cherries got us good prices and a full crop. Plums a very full crop and low prices. We lost many because it didn't pay to market them. Peaches I believe will give us more returns and better prices in Kansas than in the Ozarks. Last year peaches at Kansas City were of better value than for three previous years. This year I had a large crop of peaches of several varieties. Plant only the best. Hill's Chili is one of the best. One gentleman said to me "I have orders for 100,000 more Hill's Chili trees than I can supply, and would engage to-day, if I could, 300,000." He said Michigan was for Hill's Chili. A Nebraskan stated he had 3,000 or 4,000 bushels, and Hill's Chili headed the list. See the importance of planting varieties that bear well. Crosby is good. The Chapin gives great satisfaction. Hill's Chili and Chapin have given uniform satisfaction. Crosby is so closely allied with Chapin that I recommend planting together. The season was very wet, then turned dry, and when the later rains set in a great many branches bloomed. Pears were the most phenomenal crop I ever witnessed in Kansas. The Keiffer gave the best satisfaction, being hardy and full.

B. F.潘coast, Allen county: The condition of trees this fall is, I think, as good as I ever knew them to be. The wet summer weather left them in fine condition. This is especially so with apple, peach and cherry. Summer and some other varieties of apples were good and plentiful. I believe Ben Davis is best. Strawberry crop as good as for several years.

W. E. Barnes, Douglas county: The apple crop was good, excepting on old trees. Early in the season fruit suffered badly. Many were in a hurry to sell, and did not realize what they might. Many apples sold at 60 cents a barrel, while three weeks later we got double that. Part of the pears were good. I think pear-trees hardier than the apple in this climate. Prices were not as good as we hoped for. Some sent to cold storage, which yielded good prices.

A. Willis, Franklin county: The fruit crop in our country was very good this year in quantity and quality. The early part of the season was exceedingly dry. Strawberry crop was good; a wonder to me, as strawberries require much moisture. We had the finest strawberries this season that we ever had. Apples, peaches and pears were very good, and nearly free from insects. Prices have been very low, owing perhaps to the large quantity.

William Cutter, Geary county: Apples started out promising, but they grew slow. Dry weather destroyed many of the best summer and fall apples. Winter apples dropped with the three or four days drought that took the leaves off the trees; and people that usually sell have not enough to last all winter. Trees in fair condition for another year. Many grapes did not bear a 10-per-cent. crop, and vines are in bad condition for next year. Strawberries nearly wiped out. Prospects are not promising for a big crop next year, unless in stone fruit. Cherries were about half a crop. Berries of all kinds were a failure, excepting raspberries; they gave us half a crop. Tree-growth was small, but for such a season all right. We have lost more trees the last year than for 10 years previous. Of old orchards, set from 1870 to 1873, one-third died in the last two years.

G. M. Munger: Greenwood county is more of a steer than a fruit county. I know of two commercial orchards, both young. Mr. Wyatt owns one, and harvested his first picking this year. My own is the other. I harvested a little. There are old orchards in the county of from one to 25 acres in bearing. We had this year unfortunate climatic conditions, and no rain from January 1 until August 1. We had showers, but no rain that moistened the ground and would benefit any growth deeper than grass. The trees bloomed freely, and there was a full crop of fruit set. It did not generally fill well, and fruit fell badly, so there was a small harvest—the first time for years. We have had plenty of home-grown apples. The growth of my Ben Davis trees was very light—between four and 10 inches in the joints. Mr. Wyatt has an orchard of very thrifty Ben Davis. The condition is rather an uncommon one. The orchard is surrounded by a hedge planted a number of years before the orchard. He planted first an apple and then a peach, and then an apple, and so on alternately. It was in the western edge of a storm that passed over Greenwood county, and of the apples on the trees at that time Mr. Wyatt lost less than 25 per cent. in that wide-spread storm. The condition of the trees on my place is excellent—100 per cent. better than in September. Ben Davis was practically defoliated in September, when it usually retains its foliage until December. Yet the trees are healthy and strong. The condition of commercial orchards in the county is good. There were only enough peaches raised for family purposes—none for market.

I. Wyatt, Greenwood county: I have an orchard of over 5,000 trees, in

variety. My idea was, first to get good subsoil and then get good varieties. In a new country fruit of every kind is undeveloped, and I had to experiment a great deal to know what varieties would do in that locality. The result was, my trees came according to orders as to name, but unfortunately I got some that did not bear well. To the present day I have a number of such varieties. When I set out my commercial orchard I knew we had high winds from the south, and I wished to overcome that. My idea was to run my trees north and south in rows—first an apple-row, next a peach-row, and so on. Peach-trees grow faster than apple. Result, the apples were small for two years, while the peaches made a nice growth, protecting the apples. Now I have as fine a young orchard as there is in the state. The peach-trees have a fine growth, and serve as protection to the apple-trees from the wind, and being planted north and south, in straight lines, let daylight and sunlight to the roots. I had a fair crop of fruit last season, and the prospect for next year of all varieties in my orchard is unusually good. Fruit-buds are well developed and trees in healthy condition for winter. They shed their foliage in October. The wood ripened splendidly. The fruit-buds are healthy, and unless we have an unusually severe winter peaches will yield a fair crop. I have had peaches when the mercury has been to 20 below zero, and I have lost peaches when the mercury was not so low. I account for it that the peach-buds were unusually advanced in the fall. I blocked 24 feet by 32 feet, marked out one way with a corn-marker, then planted my trees on every seventh row, going east and west. The apples had plenty of room. My apples have been planted 7 to 10 years. The peaches grew rapidly. I was in the extreme edge of the showers, until the rain came later. Part I did not cultivate, part I cultivated thoroughly. The part cultivated gave best results. The impression prevails in the southern and western part of the state that peach-trees planted with apples or pears keep the apples and pears from early-bearing, and injure the trees. I would like others to say if they think they lost by the peaches robbing the apples. My experience is that they do not interfere. I had as fine Ben Davis this year as I ever saw. I have 25 acres of Ben Davis, and every other tree is a peach, while part are all apples, of different varieties. I had as fine specimens of apple among the peaches as I wish to see. I think it a benefit. My oldest orchard is 22 years old. I have never produced as fine apples as when every other tree was a peach-tree.

Edwin Snyder, Jefferson county: Conditions about as reported from Douglas county. It was very dry in the early season. We had a good crop of apples and peaches—peaches about half or two-thirds of a crop. There are few commercial orchards in our county. Our farmers sold too early; I did myself. The condition of trees is good. Some of us made a mistake in setting out too many varieties. In 1873 I planted an orchard of about 400 trees—about 40 varieties; it is unprofitable. This winter I shall cut down two-thirds of it. In a new commercial orchard I planted five varieties. Several commercial orchards will be planted this season.

E. P. Diehl, Johnson county: We had a full crop. The first half of September it was exceedingly wet, the last half very hot. Our apples suffered, and we had no market. It scarcely justified us to gather. The condition of trees is good for next season. We sold too early. Small fruit we do not complain of, except it did not do well. The weather was very hot and dry. The latter part of August many apples fell. Still there were plenty left, and of fair size, and what I call a good crop. I believe most of them called it a better

crop than for four or five years. Quinces were an extra good crop, and cheap. In Kansas City I had to pay \$3 a bushel for quinces, and it seemed a pity they could not get a better price in Labette county. At one place I found the family all out picking Jonathan apples and selling them at 20 cents a bushel, and quinces were going to waste under the trees. They had a fair crop of strawberries; a poor peach crop, and not many pears. Of cherries some varieties did better than others. Grapes in old vineyards rotted badly. Some prunes and apricots. Raspberries and blackberries not an extra crop. A fair gooseberry crop, but no currants.

F. Wellhouse, Leavenworth county: Had a fine show in the spring, and big prospects of getting rich this year, but the hot winds and rains cut our crop down. When we came to gather and sell at small prices our crop was probably one-half what we expected. What we put in cold storage we expect to get good prices for, but those we have sold brought little. We sold about two-thirds for little more than enough to pay for picking. We were disappointed; we expected as fine a crop as we ever grew, but we did not get it, owing to the weather. We got more out of our orchards than any other ground we had in cultivation. I think we ought not to complain; no other crop paid us as well.

J. C. Evans, President of Missouri State Horticultural Society, in response from "Missouri" county: I am glad to be with you to-day, and trust that my stay will be as pleasant as at your state meeting last year. Missouri, I will say that, so far as her fruit interests are concerned, is in a very good fix. Our orchards and small fruits were never in as good condition at this season of the year. We have had trying and unfavorable conditions during the entire year that caused apples in the central part of the state to drop to the extent of 33½ to 50 per cent. These apples were gathered by people near the market and sold at a great sacrifice—as low as 10 cents a bushel—and many were not sold at all. Perhaps a million bushels wasted in the orchards for want of a way to utilize them. The peach crop was better in the central and northern part than in the south, where we expect a peach crop nearly every year. We do not know the reason, but such was the fact. Along the Missouri river and north it was better than south. Some of the southern portions failed entirely in peaches.

S. J. Baldwin, Nemaha county: Apples, a very fair yield. They ripened prematurely, however, and about half dropped before picking time. Those that remained were very fine, and more highly colored than usual. Early apples were good, and did not drop badly. Yellow Transparent, young trees loaded with fine fruit. Trees three years planted had a bushel on. The others best were Early Harvest, Maiden's Blush, Rambo, Grimes's Golden, Pennock, Wealthy, Fulton, Fall Wine, Jonathan, Ben Davis, Missouri Pippin, Genet, and Winesap. Cherries were a full crop—Early Richmond, Montmorency, English Morello, Governor Wood, Empress Eugene and Wragg leading. Plums were loaded and very fine; Wild Goose leading all native sorts; Lombard, Bradshaw, Pond's Damson, Improved Gage, were fine and almost free from insects; the Japan plums were splendid—Abundance and Burbank leading. Peaches did well; the best varieties were, Alexander, Amsden, and Mountain Rose. Pears—Kieffer, Bartlett and Buffum, standard, and Duchess and Seckel, dwarf, did best. Apricots did fairly well—American sorts better than Russian. Nectarines did well. Strawberries were scant. Raspberries a full crop—those leading were, Kansas, Gregg, Mammoth Cluster, and Souhegan. Blackberries were a failure; too dry. Goose-

berries good—best sorts Houghton and Downing; Industry no good. Currants—Fay, Red Dutch, Versailles and White Grape all did well. Grapes about half a crop—Concord, Worden and Lady doing best.

H. L. Ferris, Osage county: Season dry at first. Uncultivated and old orchards dropped their fruit somewhat. We can profit by this experience. Cultivated orchards did better than uncultivated ones, and young trees keep their crop best. Peaches injured the apple market. Early apples brought poor prices—in fact we could not sell them at all until peaches were exhausted. Ben Davis not quite up to the standard—not as good as last year. Winesaps were best I ever had. The Missouri Pippins were so heavily loaded they broke the trees down. They don't fall; they stick to the trees. On trees where I tried to thin them, every limb but one broke. Off kinds bore this year that never had borne before. I have planted four orchards—three with peaches, one without. The ones with peach-trees in them are more symmetrical and more of them lived, and were not sunburned. The apple-trees are larger to-day than had peach-trees planted with them, and I did not have to replant so many. The apple-trees were not nine years old before I cut out the peach-trees. In an orchard I planted for another man he let the peach-trees stay, and they crowded the apples and hurt them.

C. D. Martindale, Osage county: Small fruits this year—strawberries in particular—were not over half a crop; largely caused by rust. Blackberries did well. Early apples very good, but prices low. Winter apples in cultivated orchards were fine. In old orchards the fruit was small. I found by experience that it pays to cultivate. One orchard I saw East was 20 years old, but healthy and in fine condition. The owner plowed twice a year and kept the trees trimmed, and has fine fruit. Peaches were fine. By cutting back one-half of each year's growth peaches come one-half to one-third larger, and trees are healthier, fruit finer quality and extra heavy, and sell more readily. I got over 200 bushels. Peach-trees among apple-trees are a benefit, especially when young. I plant apple-trees 30 feet apart, and peaches between. The trees are more symmetrical and healthier, and not so liable to be blown over.

Dr. J. Stayman, Leavenworth county: The condition is not as good as usual. We have not succeeded as well as usual. The crop was not more than half. Some orchards very full, and some not. Condition for another year looks favorable.

Fred. Eason, Leavenworth county: We had about half a crop of fruit. Some varieties of apples we heard nothing of this year, and some were full. My Ben Davis trees bore full crop. We had superior fruit and less insects. I think the fruit crop generally good. Fruit is as mellow now as it should be in February. I never saw as clean and beautiful a crop of fruit.

L. Houk, Reno county: These seats ought to be filled by our Western people. They are probably waiting until the rewards of fruit-growing are better. In April, and until the last of May, we had no rain. Fruit-trees were heavily loaded, but from lack of moisture our fruit crop matured too early. The ground was covered with immature apples. The codling-worm was partly accountable, and warm weather was favorable to the development of insects. We found the apple-worm worse than it has ever been. The result is, that at Christmas time there will be few apples. The pear crop was better. The Keiffer was a full crop, and the trees held their fruit better than apples. We had quite a peach crop, particularly seedlings, Hale's Early, Alexander and Amsden. In my experience that class of peaches is more reli-

able than others. Hale's seedlings are most all hardy. Hill's Chili is a very hardy peach. That class, including the Crosby, and probably the Elberta, is good. Some say Elberta is as hardy as any. Grapes, hardly a fourth of a crop; supply not equal to home demand. Strawberries were not a good crop.

AFTERNOON SESSION.

December 10, 1895—1:30 o'clock.

Called to order by the President!

Committees were appointed as follows:

On Constitution.—G. C. Brackett, F. Holsinger, and Fred Eason.

On Exhibited Articles.—William Cutter, E. K. Wolverton, and A. L. Williams.

On Auditing Accounts.—G. Y. Johnson, G. W. Bailey, and Philip Lux.

On Resolutions.—L. Houk, A. Chandler, and J. Stayman.

On Membership.—G. W. Maffett, B. F. Smith, and Gus. Thompson.

ORCHARD REPORTS.—Continued.

C. M. Irwin, Sedgwick county: Dry weather caused many of our apples to fall early without maturing; crop was not the best. Peaches, nothing extra. Plums and cherries, a good yield. Grapes poor; first late frost hurt them, then heavy winds bruised and split the grapes that did not fall. Strawberries almost a failure. Trees in good shape for coming year.

Philip Lux, Shawnee county: Grapes—A hot week in March started the buds, and a sudden cool change made them sick, the result being a poor crop. We had enough for home market; and for a few days they were a drug. Strawberries—Some very fine, but not a full crop. Apples—A fine crop; never had finer in the county; not as many as expected, but excellent. Peaches a good crop. Raspberries and blackberries plenty. Condition of orchards—The dry spell last spring lasted long enough to tell on our Ben Davis; many of the old trees died, and many trees were weakened by it; but it did not affect our younger and thriftier Ben Davis. Our people put them on the market before the weather got cool enough to handle apples, result was they did not make much. Those who held back made money.

A. Obendorf, Nemaha county: Strawberries none. Raspberries and blackberries few, owing to dry weather. The cold weather Mr. Lux spoke of made the grape crop light, I think barely 10 per cent. Peaches did well, seedlings remarkably well. Pears did well, better than cherries. Apple prospects were very good; our apple crop was a large one, but quality poor. We had few sound apples; the trees seemed to be in good condition. Our young Ben Davis trees were not hurt, but the old trees were.

E. K. Wolverton, Washington county: Dry weather the last three years has injured almost everything. Strawberry-plants died from the dry weather. Peach-trees were neglected, and there was little from them. Pears have never succeeded with us, although those who had pears did well this year. The Little Red Romanite, the White Pippin and Missouri Pippin were the only apples that stayed with us, and half of them were on the ground by picking time. We had light rains, not enough to soak the ground over four or five inches. The Ben Davis is poorer than others in western Kansas.

Edwin Taylor, Secretary, Wyandotte county: This has been a good season

in the fruit line. Strawberry crop small, but good. Grapes a full crop. More than a crop of cherries. Peaches, fair crop. Apples an excellent crop. The summer varieties bore full, and the fruit was fine. Fall and winter apples, without exception, did well. We never had finer apples, and the crop was large. We picked more apples in Wyandotte county than ever before, I think. Ben Davis has done particularly well. All made a fine crop, and the fruit was remarkably fine in my orchard.

G. Y. Johnson: At the close of our session this forenoon Hill's Chili peach was mentioned. I would be very glad to take mine off at the ground. I do not know why it was ever sent out. I found but one merit in it—it was hardy. Have you the reputation of this peach in Nebraska? This peach down in the Ozark may not prove the same as in Nebraska and Michigan.

L. Houk: The Western New York Horticultural Society declared Hill's Chili a hardy peach; Crosby, Elberta, early, good, and healthy; Smock and Stevens the last. Hill's Chili is not brilliant or large, but it is reliable.

A. H. Griesa: They raise it in New York largely, and it brought \$1.50 a bushel at the cannery, as it does not shrink in canning. They all recommend it for its hardiness. This matter of canning is a valuable quality in this peach.

President: We have dozens of peaches that are just as good and hardy. The family favorites are Bonanza, Gold Dust, and Elberta. The Bonanza is very profitable. The trouble is we have to thin them. No matter whether there are other peaches or not, they are always full, and the family favorite.

G. Y. Johnson: All sold their crops too early. Is any one here who did not, and have sold since—can they give us the relative amount they saved, in dollars and cents? I think I made more money selling right on the ground and from the trees than when I sold later.

B. F. Smith: I sold windfalls as soon as I could. I shipped the first car-load to Nebraska, and that netted me 25 cents; the balance I gathered and sold in the orchard for 40 cents a bushel. That took everything except the very small and imperfect apples. We then gathered up everything and sold for 15 cents a bushel. We put none in cold storage. Last year I placed my apples in cold storage, and got from \$3.50 to \$5 a barrel. I thought there were no apples excepting in western Missouri, eastern Kansas, southeast Nebraska and southwest Iowa, and thought it safe to hold in cold storage and sell after Christmas. This year I put none in cold storage. It is a doubtful experiment. I sold and am selling in Kansas City market, and getting from \$2.25 to \$3 a barrel for the best. We are selling as fast as we can. So many have gone into cold storage, you will hear something drop after Christmas.

J. A. Thompson: Our Jonathan apples we put in cold storage. Some sold for \$1.50 a barrel, a pretty good sale; but we are now selling on the Kansas City market and getting from \$3.50 to \$4 for Jonathan. We put seconds in cold storage, and they are selling readily at \$2.25. The expense is 40 cents storage and 25 cents commission per barrel. I think it will pay us for holding this year. They did not have to be repacked. Our thirds rotted under the trees.

F. Holsinger: I have over 700 barrels of first-class apples in cold storage in Kansas City, waiting for a better market. I sold windfalls at wholesale at 20 cents per bushel, by the wagon-load I got 25 cents per bushel. Seconds sold at from 30 to 50 cents right in the orchard. Apples were never in better condition. My apples were protected from the sun by the apple-tree itself and the peach-tree south of it, and had an advantage over orchards without

protection. There were windfalls that I could have put in cold storage, and I had no doubt they would have been good. I have about 200 bushels in variety buried for better times.

NATIONAL UNITY OF OUR HORTICULTURAL INTERESTS.

(By E. Gale, of Mangona, Fla., Ex-President of the Society.)

It is with pleasure that I comply with your kindly-expressed request for a paper to be read at the meeting of your Society. I should rejoice to be with you. I have a Kansan's pride in the grand success of the dear old Society.

In looking back over the horticultural development of the past 50 years, there is abundant occasion for wonder and gratitude. Progress in modes of culture, increase and improvement of varieties, and introduction of new fruits is wonderful. Compare the orchards of 50 years ago with the orchards of to-day; or the fruit in the farmer's cellar a half century ago with the fruit of to-day. In other directions progress has been even greater. As for example, the triumphs of grape and strawberry. The bringing out of new varieties by men who have given their lives to this work affords reason for congratulation by all lovers of good fruit; more especially from a humanitarian standpoint. In the interest of mankind there can scarcely be a more important consideration than the increase in quantity and improvement in quality of our fruit.

Good fruit, furnished in quantities to meet the demands of the masses and at reasonable prices, is a matter of grave moment. It should be our aim as true horticulturists to place in the markets not only an abundance, but the best of fruit, at reasonable prices. We are not simply to furnish fruit for "the four hundred," but for the million. The grandest triumph of horticulture will be in devising means to furnish the world good fruit in variety and abundance and at prices that will bring it within the reach of all. Of course we do not advocate furnishing fruit beneath the cost of production. If this occurs at all it will be found associated with an unjust system of transportation. It is a fact too often overlooked that the horticulture of our country is more intimately dependent upon transportation than even general agriculture. In general it may be said that all our prospects of profit are dependent upon reasonable freight-charges, careful handling and prompt delivery. The production of fruits and vegetables may with profit be vastly increased. An increase in the consumption has always followed increased production of good fruit. We may assume as a fact that the larger the supply of good fruit the greater the measure of comfort in the home, and better the health of the people. This question involves not only the fruit supply, but we shall be called upon to lead in creating a demand. It will often be our duty to teach men the true value of a fruit diet. Education in this direction is essential. It is horticultural men who must take the lead in this work. Only a few years ago the orange was regarded by the mass of our people simply as a luxury, and one box was then consumed where hundreds now find ready market. A few years since the pineapple was almost unknown in the general market; now it is everywhere, and so plentiful that all may enjoy it. The cry of overproduction of the orange was raised in Florida a few years ago, but men never made a greater mistake. It is true prices generally declined, but consumption increased vastly. (It may be well to remember that a decline in prices should not be always all charged to overproduction.) The introduction of new varieties of fruit and of new fruits is an important part of the work of horticultural societies. Over this work there should not be and can hardly be any local jealousies. Thus the pineapple has come rapidly into favor, to fill a field of

its own, not to supplant demand for anything else. Each new fruit will make a field of its own. Some of the Japanese fruits have deservedly attracted attention. In localities suited to their development some will become popular. There are some fruits lately introduced into the far South worthy of general favor. Four or five may be specially noted. First should be the mango. This king among tropical fruits is quite new even in southern Florida. It has strong claims for a favorable reception by lovers of good fruit. The delicious character of choice varieties of this fruit, the many uses to which it can be applied in the family, the tropical luxuriance of the tree all make it a candidate for popular notice. Though found occasionally on New York market-stands, it is even there practically a new fruit. Hitherto the supply has been imported. This has not served to make the fruit as popular as it might otherwise have been, for it needed to be gathered in a very green state. So far little attention has been given to its improvement, and none but seedlings have been grown. Seedling mangoes are as unreliable as seedling peaches. Since it has been found the mango can be budded as easily as the peach, mango culture will stride forward. When our trees are sufficiently advanced mangoes can be placed on the markets of the North in such condition and quality as to command the notice of lovers of choice fruit. This may be said of the avocado pear, the sapodilla, ti-ess, or egg-fruit, and the *Monstera deliciosa*, or cerimon. These by no means cover the list of new and desirable tropical fruits, but in the improvement and introduction of these there is work enough for a lifetime.

We have a national interest in the improvement and introduction of old varieties of well-known fruits, as well as in the introduction of new kinds. It matters little whether they grow over large or small areas of our country; we have a general interest in the interchange of these products. We want and must have the apples, peaches, and other fruits of the North, while in turn you want our oranges, lemons, pineapples, and other fruits of the South. Your market is with us, ours with you. This interchange will increase as the years roll on. Splendid pineapples are grown in England at \$5 apiece, but we must go to their national home to grow them for the millions. You can grow strawberries in Kansas at 10 cents a quart: we can grow them on Lake Worth at 50 cents a quart; yet you will make the most money. The question of adaptation of certain fruits to certain soils and climates is a question of practical moment and of national importance. It is the best of all horticultural success. Ideal horticulture will be attained only when each fruit has found its natural soil and climate. The best results will then be attained. Here we are met by complicated problems. Some are of national importance. The one most perplexing is that of transportation. Ideal horticulture involves prompt and careful transportation, and reliable rates not subject to change from month to month or year to year. We need a transportation system, accommodating itself to the wants of society, and not a society that must shape itself to the convenience of transportation. At present the producing classes are feeding that system. Plant orchards in the most desirable regions of our beautiful land, and you do it at your peril. After years of work and waiting, when your orchards are laden with delicious fruit, you are confronted by the unwelcome fact that your luscious peaches and beautiful red apples are practically worthless. Many of you have met this experience. Horticultural enterprises in various parts of the country that promised well for all concerned, have been practically abandoned because of the unyielding transportation system. The question of the day is the molding of our transportation

system to the demands of production. Nationally we have a common interest in this question. Reform is called for in the interest of mankind. No people need it more than horticulturists. It is certain we can secure no reform single-handed. This demand should be backed by the combined forces of all the producing classes. Are we ready for it, or will we delay until we are ground to powder? Can we now rise to the demands of the hour? The experience of the past years points to one result, and that the concentration of all the producing forces of the nation for the crushing of corporate monopoly and the nationalization of our transportation system.

DISCUSSION.

Edwin Taylor: This is an able paper. It touches the many-sided subject of national unity of transportation. The company does not exist for companies—they exist for the company, as the gentleman says. We want to avail ourselves of that position, and the only way to do it is by national unity.

G. Y. Johnson: My experience the last three years has been, in shipping fruit, the express company, in combination with the railroad company, have gotten the bulk of my earnings in the fruit line. What is the remedy?

A voice: Because they are united and the shippers are not. I found this out in shipping fruit. Last year I had 1,000 bushels of peaches of good quality. I wrote the Wells-Fargo Company, Kansas City. They wrote me they would give me as good rates as they could. At one end of the line I got a 15 per cent. better rate than at the other. I started at 85 cents at my end, and at the other end it was \$1. Transportation eats the profit, unless we ship in car lots. In my vicinity we have several hundred acres of commercial orchards—apples and peaches. Some of us sold peaches on the tree. Result, we were on top, and the buyers were in the hole to the tune of hundreds of dollars. The freight was too high. They sold a car of peaches in Kansas City for less than the express. They sent a car-load to a Missouri town, and before they got there their freight, from what they were promised at the start, was more than the peaches would bring. Without running them farther they simply dumped them at the first station, and quit.

Dr. J. Stayman: The subject-matter of this is too lengthy to be discussed intelligently just now.

E. J. Holman: The question before us is how to relieve ourselves of the present tariff on fruit carriage. I would like to see this matter discussed, and know if there is any way to get transportation for less money. Now I have had some experience in this matter, and frequently made application to the railroad and express companies; once when I was shipping 25 crates of strawberries a day I got a rate on the Union Pacific of \$2.25 a hundred. When I shipped only 20 crates a day they came down on me and made it \$3 a hundred. That shut me out. I went down to Topeka, figured there, and found I could ship cherries by the Santa Fe refrigerator-cars, at \$1.65 a hundred, to Pueblo—much cheaper than by Union Pacific. It is the best thing that ever happened to me. The only way out is for the growers to combine. If we get together locally, and get fruit enough of a kind we can get rates. They say, "Gentlemen, if you ship so much you can have such a rate." The small growers must combine. It is the only way we can get rates, and refrigerator-cars are as good or better than by express. They went by refrigerator-car much better and at one-half the express-rate.

J. C. Evans: I have had little experience except in car lots. We get good reduction on car lots, but no other way. By working through these organiza-

tions you can talk to the railroad or express company. The first question is, "How much have you got?" If you work through a combination of small growers, and can tell them so many car-loads, they want it and they will cut to get it. The same with express companies; to work the express companies we threaten to ship by freight. This year there was a fight between the companies, and we could choose between express and railroad. They came to us. "When thieves fall out honest men get their dues." When we showed the agent the vast orchards of thousands of trees, and told him we must have cheaper transportation, he said he would get us a dollar rate in car lots. I insisted it should be a dollar a hundred for all shipments. Finally I said, "We are putting in an evaporator and cannery, and will not pay more than \$1 a hundred, and will not ship unless you give us that rate." And he agreed to the dollar rate there.

A. Chandler: What would be the probable condition of the markets in this regard? I think we would have to look further than the transportation.

W. H. Barnes, Acting Secretary: The railroads favor car lots, and that does not affect 1 per cent. of the shippers throughout this state. I have been shipping stuff by express for 20 years. I find the smaller towns the better markets. I always get more money in small than in large towns. We must send in small lots. If we had car lots, it would not pay to send so. Something must be done for small growers. There were express companies in this country before there were railroads. I have argued with route agents on this subject, and I start in by saying, "I have no use in the world for the express company." I contend it is not right for us to pay the presidents of half a dozen express companies \$50,000 salary, and half a dozen vice-presidents and other fellows large salaries. Where there is a railroad there is no reason why they cannot put on special cars for these things. Expressmen have told me that they pay 60 per cent. of their gross earnings to the railroad company, and they are under contract to make their charges not less than 1½ what the freight would be in same class. And 60 per cent. goes to the railroad company, and we pay it.

F. Holsinger: The man with a few apples or peaches cannot get a rate that one with a large amount of produce gets. A man with a large amount of produce can get a decent rate. Low rates are only offered where shipments are large. We can accomplish nothing but by combination.

J. L. Williams: We talk about high rates for transportation, and yet we find not a railroad in Kansas is paying 3 per cent. dividends on its stock. In many cases we pay too much. I would like a remedy.

E. R. Wolverton: Every individual has a right to reduced rates. If reduced rates are given to large shippers, why not to the small? The Summerville Shipping Union commence loading a car at the extreme edge of the state of Missouri. They put on a few boxes of fruit there; at the next station they put on a few, and so on. They finish loading way up towards Springfield. The transportation on this car is put at such reduced rates that growers can well afford to join that association, and ship that way. If you have a few cases, you ship this way, and they gather as they go on, and yet get the benefit of reduced rates, because they get a car-load. The secret is co-operation.

Edwin Snyder: We will not be able to settle the question here. I have had much experience, and I do not believe there can be at present national unity of transportation.

DISCUSSION ON COLD STORAGE.

The President: I have very little experience with cold storage. We put some fruit in cold storage last year, and it did well. We have a lot in this winter, and expect to do well with it. We are favorably impressed with it. Cold storage is too expensive for individuals to build, as the temperature cannot be regulated properly. It has been much improved in the last five years, and it is so now they can thoroughly control the temperature, if properly made. I am not familiar enough with it to give a thorough description of a cold-storage plant. It is not necessary, as none of us probably are able to put one up just for our own fruit. A good plant costs from \$20,000 to \$40,000, and must run the year round to pay; and we fruit-raisers cannot keep it full. It must be where they can get enough to keep running the year round. All we need to know is that it can be done, and it pays to put our fruit in. In our experience we have found it very profitable. It was from 10 to 20 miles from our orchard, and we had to pay transportation, and then pay the cold-storage fee, yet it paid us well. In 1894 we had 2,800 barrels of apples in over winter. They brought us in the spring, after paying expenses, \$1,700 more than the best offer in the fall. Cold storage cost us 50 cents a barrel. They keep the temperature at from 33 to 35 degrees. The improvements in their machinery enables them to keep it at that point. The shrinkage in 2,800 barrels was less than 2 per cent. We had to take the specked apples out and repack them, in the same barrels. In January we shipped some without repacking. I am satisfied that fruit men must rely largely on cold storage to prevent glutting the market in fall. I have no experience except with Jonathan, Ben Davis and Missouri Pippin apples. The market is always flooded at the time the Maiden's Blush comes in, and it would be well to run them into cold storage for a short time until the glut is over. They use salt water to distribute the cold, but I could not tell you about the advantage of it, or how they regulate it. I have not gone into details, as I do not expect to run a cold-storage plant, and have not investigated the details, but I know the results.

Q. Have you ever put apples in the cold storage where no artificial means were used?

A. No, sir; but I have satisfied myself that the temperature cannot be properly regulated. The temperature of the earth below the action of the sun is about 50 degrees, and that is too high to keep fruit. We can keep it in cellars and out doors almost as low as in that place.

Q. How long will they keep after taking them out of cold storage?

A. That is an important question. They should be consumed within 30 days. The dealers do not bother their heads about that. They say it gives them sufficient time to market them, and that is all they care for.

L. Houk: At Hutchinson a cold-storage plant is in connection with the salt plant and ice plant. In the salt plant the brine is pumped up from the ground in about the right condition, except as to the necessary steps to refrigerate. You want it a little below 32 degrees for butter, and about 32 degrees for eggs or fruit, and all these things were kept in this place. The exact temperature can be had, and charges are reasonable. This is readily available in that section. I found that Concord grapes kept well, and held up perfectly.

The President: An automatic self-registering thermometer tells the temperature at all times. One of the cold-storage men in Topeka says this is essential; they have no knowledge, unless they have the thermometer to tell

them, whether the operator is doing his duty or not. With this self-registering thermometer the fruit-grower can tell exactly whether the temperature has been rightly kept. It records the temperature at every moment of the time; and once a week the register card is taken out and a new one put in, and they show a record of the temperature the entire week. It holds the operator responsible.

F. Holsinger: While talking about cold storage, I am favorably impressed with my experience. I had 1,000 barrels of apples last year, and I gave the cold-storage company power to sell, at the usual commission, which they did. In selling the first 400 barrels they reported a loss of 10 barrels for plugging. They took out the heads and used other barrels to plug them. I told them there would be no more plugging. I said, "Sell them as they are, or not at all." I do not say there was anything wrong, but I lost 10 barrels of apples. Cold storage is not successful for small fruits. Peaches cannot be kept in cold storage. Grapes have been; but if you place small fruits and grapes in cold storage you must do so while they are cool. If they get heated before placing in, fermentation will set in. I have tried with raspberries and strawberries, but without satisfaction. I saw some delicious pears in cold storage this fall. I also saw cabbage that was crisp and brittle, and eggs fresh and nice. They were placed in there in May, and taken out the next February and March, and were good.

G. Y. Johnson: Parties of experience claim that fruit had kept best without artificial means. If that be true, in much of the fruit-growing portion of Kansas men can make their own cold storage. It is claimed the entrenchment plan was successful, and that fruit would keep longer after being taken out of it than when taken from cold storage.

Fred. Eason: Mr. Farrell took me through his cold storage at Leavenworth. It was about 17 feet deep, with 9 feet of earth over it. He expected to keep it at the freezing point, or just as cool as possible, but could not do it. When I put my apples in in the fall, if I had had ice enough to cool it it would have been all right. I think there is no way to keep fruit in a cellar underground. I do not believe you can keep it lower than 50 degrees, with no ventilation. The first apples I put in I got below freezing point when I put the apples down. They froze some in the cellar, and we covered over to make it air-tight. All the benefit got out of it was in losing two and keeping one crop of apples; but I got enough by keeping one crop of apples.

J. C. Evans: I have had some experience in storage underground, and I have it so we can let cool air in. The walls are very thick. It is built so the cold air can get in at one end and out at the other end. The difficulty is to get apples in cold; and I believe if I had had ice right off, with those holes to let cold air in, I could have had just as good cold storage as I wanted. I keep some apples myself. The only trouble I had was, I could not market them all together. I sold a car-load to Cincinnati, pressed down in the barrels as hard as they could be. It was in April, and the barrels got so the fruit shook. I advised the grocers to take only what they could sell quickly. I found they would speck. They kept better in the dark than in the light. If when I gathered my apples I had left them out until cold, I would have had as good cold storage as I wanted, because when the cold weather came I could let in cold air. Had I kept my farm I would have had an ice-house right over the cellar; then I could keep them all right.

President Wellhouse: Mr. Richardson, at Leavenworth, depends not only on artificial cold, but on night circulation also. When a cold night comes they

open up and allow circulation. He says circulation is a very important part of cold storage. To avoid glutting the market in the fall it is necessary to use cold storage. It is of great importance, and will be the means of increasing fruit-growing.

E. J. Holman: I think the cold-storage process of Mr. Farrell's valuable for keeping fruits. I have seen fruits, especially apples, come out of there in fine condition. I think that we fruit-growers might find cellars valuable to us to hold fruits for a time, until the glut was over. But when it comes to holding fruit for a year, it must be only by artificial cold storage. Fruit put in a close place will not keep, for lack of proper ventilation. If a cellar be dug in a north hillside, it gets 'no sun's rays.'

J. C. Evans: I began cold storage in 1888. I have had some experience each year since. I tried all varieties of fruit, and both kinds of cold storage, and I found no stone fruits—unless you call grapes stone fruit—will keep in cold storage. Grapes keep very well, if properly managed, but all other stone fruits go down quickly. Apples keep very well, except Early Harvest and Red Astrachan. Some pears keep very well, and others melt down quickly, similar to the Early Harvest apples. Maiden's Blush keep well in cold storage. Cold storage is of two kinds; one is the chemical cold process, the other is a room with ice packed either about or around the sides, in contact with its walls, to keep it cool. The latter, in my opinion, is the best up to the present time. If you put fruits too near this chemical cold, they get too cold; the skin turns brown, and the apples will be marked with brown spots. It spoils the sale of Ben Davis, but does not rot it. A man in our county never takes apples to market until late, then markets up to May. I have known him to sell at \$14 a barrel. His name is C. Alls. He has no cold storage. He handles Ben Davis, Huntsman, and others. His system is a cave dug in the ground and rudely walled to the top; there he has round logs, and a roof over that. It is so arranged that he can at all times control the current of air. This fall we dug a hole 200 by 46 feet, 11 feet deep; put down a double floor, with sawdust between. It runs north and south. The apples are in barrels, set one on top of another, four feet high. We brought the temperature down, and have no trouble to hold it at 40 degrees, and see no evidence that the apples are not keeping well. We had in one corner the best of the windfalls, and we sold them last week for \$1.75 a barrel. We lost very few. We have overhauled some. They will not shrink 1 per cent. We can lower the temperature since the weather has gotten low. If I had free cold storage and my building, I would take the building, for when we take the fruit out we know it will stand up until sold. Ventilation goes right through. We have a driveway right through. We have a storm-door, with an anteroom 12 feet square. We used the dirt we took out to bank up at the sides. I should think the average thickness about $5\frac{1}{2}$ feet. Air comes in at one door and out at the other. You can control your temperature in a large building better than in a small one. The capacity of our building is 15,000 barrels; it is 46 by 250 feet. We figured it at \$1,000, and about 85 loads of sawdust, making eight inches between the ceiling and the upper floor; and we put building paper overhead. If I had no sawdust, I should also paper the top of the joists before I put the floor on, and leave an eight-inch dead air-space overhead. The roof is made of dimension stuff; two by four for rafters, and then rough boards, tongued and grooved, well battened. The roof is painted first, the battens are painted separately, and the cracks are filled with paint. The boards of the roof project three feet over, and the

ground slopes rapidly down, so water runs away from the building. The temperature outside, when we put the fruit in, was way up to 70 degrees. Many days it got up to 70 degrees when we were picking apples.

W. H. Barnes, Acting Secretary: We are going to try cold storage. We have kept a table of apples at the capitol at Topeka since last July. A great many visitors come there from different parts to examine our apples, and we want to keep up an assortment of apples there that cannot be beaten.

E. J. Holman: I have a building that I want to turn into a cold storage, as has been talked of. It is 60 by 25, and I can pack ice on each side and put my barrels of fruit in and keep them myself, if I had the ice. The difficulty is in getting our apples in during the hot weather in September. In a chemical cold-storage plant they can keep them if put in any time in the summer. The difficulty for the farmer is to get them into such cold storage as referred to. Someone here asked whether you can keep your summer fruit or not. I keep mine. I had plums on exhibition at the state fair in September from cold storage.

WHAT TO DO WITH SECONDS AND CULL APPLES.

By J. C. Evans, President of the Missouri State Horticultural Society.

Since many commercial orchards in the West have come into bearing the question arises in the mind of the orchardist, What can be done with the vast quantity of windfalls and culls of our orchards?

It is a fact that at least 30 per cent. of the crop cannot be packed and sent to market. Nor is this confined to apples; pears, peaches and plums each have a large waste. These latter are more difficult to handle than apples, as they come earlier and must be handled more quickly. There is always a demand for canned or evaporated peaches at some price, but since the country has been flooded with canneries and evaporating plants prices are so low that the product scarcely pays for the labor. There is a growing demand among hotels, eating-houses and pie-makers for canned apples in gallons, and at one time we thought this solved the problem of "what to do with our cull apples," but like most other products in this line prices are so low it hardly pays for labor and expenses of preparation.

Apples can be evaporated at a cost of about 5 cents a bushel, and a bushel will make five pounds of dried fruit, worth now about 4½ cents a pound, or nearly 25 cents for the product of a bushel, leaving 20 cents for fruit, freight and commission. If we could utilize in canning and evaporating all the waste products of our orchards and sell all readily at a small profit, then the problem would be solved; but can we? I say "No." There are now in hands of packers canned goods of 1894 that could not be sold at any time up to now for more than the bare cost of packing. Slick-tongued agents have covered the country, and persuaded the people of many small towns to invest in a cannery. They agree to furnish the outfit for a cannery for so much (about double the value), and as an inducement will take a liberal amount of stock in the concern and the "deal" goes, the plant is erected and run the first year at a loss; the produce, good or bad, is forced on the market at a sacrifice, and this is one reason canned goods are so low. It is said there were erected last year in Indiana alone enough canneries to can goods for almost the entire country.

Many culls may be worked into jelly stock, but it must compete with that made for gelatine and other cheap material, so there is nothing for the grower of apples.

Many culls might be worked into cider, but that it sold so low now by those who make it in large quantities, that there is nothing in it for small growers. Apples make the best of vinegar, but what will we do with it when made? Go to a dealer and offer it, he will tell you he can get all the vinegar he wants at 6 or 7 cents a gallon. His customers are satisfied, he gets his profits, while admitting it is worthless stuff made of cheap acids, so there is no money for the grower in vinegar. After utilizing all culls in these ways there yet remains a large amount of "waste." The rotten, knotty, ill-shaped ones and those that drop prematurely, and so on. What will be done with this waste? "Feed it to hogs?" Well, a reasonable amount of it is good for hogs, but too much is harmful; besides what orchardist keeps hogs enough to consume all the waste of his orchards?

Now, Mr. Chairman, as there is no money in canning, evaporating, making cider or vinegar, or even feeding to hogs, the question remains unanswered, "What shall we do with our culls?" The low price of fruits the last few years, and the high rates of transportation, have made it necessary for the fruit-grower to look for some other way to turn the products of his labor into money. In what way can the windfalls, culls and waste of a commercial orchard be made to help toward paying the running expenses?

Mr. Chairman, your Secretary asked me to answer this question, and if I have not suggested anything that will help your orchardists to utilize their culls, I may at least have told some ways that will not pay, so that they need not make the mistake that many have made, and squander their means in canning factories, to be sold out at 50 cents or less on the dollar, after running one year at a great loss.

Fred. Eason: He has given us a good paper, and so turned our thoughts that we may get rid of our fruit. I have made a good deal of cider vinegar the last few years. In the market I have offered it at living rates, but could not sell it. I could buy cider for the vinegar market for 7 and 8 cents a gallon, and we cannot sell vinegar at that price. If the state established and enforced a law against those who sell impure vinegar, we might find a market for our cider vinegar. The law can prohibit the manufacture of impure vinegar in this state, but they can make vinegar outside of the state from anything and send in and sell it for cider vinegar.

Philip Lux: In Topeka they manufacture malt vinegar, and you can hardly sell any other. It keeps pickles better, and it beats cider vinegar. If an article is superior the people will have it. My experience in use of apples is: feed them to hogs which I have; to horses and cattle. I have kept all on apples instead of corn, and they will stand the comparison well. Apples are good for man, and they are good for horses, too. I came to Kansas to raise apples, and commenced early. If I had had stock enough I would have lost but few bushels of apples this fall.

Dr. J. Stayman: I apprehend little danger in Kansas for years to come to dispose of our second- and third-grade apples. The time may come when you cannot do it. You probably have not stock enough to consume the apples on your new farm, but a farm with an old orchard has cattle and hogs enough to consume every apple. As to vinegar made by the farmer in competition with acid vinegar, much care must be given to making it. If you run it off two or three times and offer it at two or three weeks old, you will have difficulty selling it. I make and sell 8 to 12 barrels a year, and grocers and people will buy it in preference to acid vinegar. I have sold at 15 and 17 cents by the barrel. It pays better than letting the apples rot.

The President: We sold all our third-grade apples this year. They brought but little. We sold 26,000 bushels to a New York man, netting about 5 cents a bushel. We sold 8,000 bushels to an Iowa man for 10 cents a bushel, free on board, netting us about 5 cents a bushel. While that is a low price, I am satisfied. The culs alone have paid us from \$5 to \$7 an acre, and that is much better than nothing; and we have first and second grades left. So we are satisfied. A Missouri man wrote us stating that thousands of bushels wasted there because of no market. In 15 years' experience I have not had a bushel of apples we could not sell at some price. While 5 cents a bushel is very low, it beats nothing. We have never undertaken to ship culs. Up to this time the buyer comes for them.

A FEW KANSAS HORTICULTURAL STATISTICS.

By Hon. F. D. Coburn, Secretary State Board of Agriculture.

Being honored by an invitation from your worthy officials to present here a few—"a few"—statistics on horticulture, I have, with a dutiful desire to intelligently comply, consulted the authorities to ascertain something of what is meant by the term "horticulture," and find that Webster says it is "the cultivation of a garden; the art of cultivating gardens." The new Century and Standard dictionaries say practically the same, and that "horticulture" pertains "to the culture of gardens." The American Cyclopedias defines it as "the most perfect method of tilling the earth so as to produce the best results, whether the products are objects of utility or of beauty—the acme of agriculture." Johnson's Universal Encyclopedia gives it as "the cultivation of a smaller area of land than a farm or a field," while the Encyclopedia Britannica says it is "the art and science of cultivation of garden plants, whether for utilitarian or decorative purposes." This great work, I may say, in passing, devotes 85 of its broad pages to this one topic, treating under its head innumerable items, from capsicum to cranberries and from lamb's lettuce to lobelia, while the other cyclopedias dismiss it with half or two-thirds of a page. Not feeling altogether sure that garden statistics were precisely what was desired, I have been prompted to discover the meaning of "pomology," and the dictionaries agree that it is "the science of fruits and the art of fruit-culture, fruit-trees or fruit-bearing shrubs." Johnson's Encyclopedia says it is "the study and culture of fruits," while the American and Britannica don't appear to know anything about it. Under these circumstances, I have been persuaded that perhaps "a few Kansas pomological statistics" may more closely approximate what is desired.

The first systematic collection and record of this class of statistics in Kansas seems to have begun in 1881, or just 15 years ago, and those gathered then and since indicate that we were in proportion to population just as strongly inclined to fruit-growing in those days as we are now—that in fact we were enthusiastic fruit-planters and fruit-eaters from the beginning. This is shown as follows:

Trees bearing—	1881.	1895.
Apple	2,754,545	7,529,915
Pear	68,072	186,874
Peach	5,418,280	3,790,632
Plum	203,983	883,874
Cherry	658,948	1,451,716
	9,173,828	13,843,071

Trees not bearing—	1881.	1895.
Apple	4,068,917	4,440,673
Pear	167,716	204,634
Peach	4,448,304	1,183,510
Plum	309,008	• 333,686
Cherry	661,920	484,057
	9,645,865	6,646,560
Total trees in 1881		18,819,693
Total trees in 1895		20,489,631
Acres in small fruits—	1881.	1895.
Raspberries	3,123	3,489
Blackberries	3,436	4,614
Strawberries	1,477	2,234
Totals	7,736	10,337

Of vineyards, there were, in 1881, 4,199 acres; in 1895 (about), 7,200 acres.

It is suggestive that the people a decade and a half ago had fruit "on the brain," by their having 7,533 acres in nurseries, while this year they report but 3,894 acres, and in some recent years considerable less.

The report shows that in the 15 years given, the value of horticultural and garden products marketed was \$26,476,323; that the great years of that period were 1881, '82, '83, '91, which averaged well toward 2½ million dollars per annum. Aside from this we are credited with manufacturing an average of more than \$121,000 worth of wine in each of the 15 years.

The statistics I have given you are general, applying to the whole state and the varied products of its many orchards and gardens. Perhaps a showing of what one of our citizens has done with a single fruit within the 15 years under review would be of equal or greater interest. He raised apples in the years named, as follows:

Year.	Bushels.	Price per barrel.
1881	3,887	\$4 00
1882	12,037	2 48
1883	12,388	3 00
1884	11,726	2 04
1885	15,373	2 00
1886	35,000	1 45
1887	33,790	2 11
1888	20,000	1 81
1889	11,952	2 50
1890	79,170	3 00
1891	63,698	1 75
1892—Failure.
1893—Failure.
1894	47,374	2 50
1895	57,380	2 00

The culls of these crops have been disposed of at from 13 to 20 cents per bushel. The crop of 1895 was from 437 acres in Leavenworth and Miami counties, planted in 1876, '79, with the exception of 3,400 bushels from a young orchard in Osage county, planted in 1889, '90, and bearing this year for the first time. These trees are so planted that the rows north and south are 32 feet apart and the trees 16 feet apart in the rows.

The varieties planted and their various proportions in this successful fruit-growing business enterprise are like this:

	Acres.
Ben Davis	620
Missouri Pippin	305
Jonathan	230
Gano	165
York Imperial	100
Winesap	85
Maiden's Blush	16
Cooper's Early White	16
Total	1,437

This overwhelming proportion of Ben Davis is not to be construed as any argument that the grower regards it as the finest fruit for use, nor that it brings to him the highest price, but is significant that by its thrift, sturdy growth, hardiness and early-bearing a producing orchard can be established in a comparatively short time; the reasonable assurance of reliable and heavy yield making the aggregate crop during the life of the plantation large; and the superior size, keeping quality, color, freedom from blemish, and outward attractiveness of its fruit, conducing to a ready sale, make this easily first in the estimation of the producer in the list of commercial varieties for profitable planting in eastern Kansas. Notwithstanding its excellence and attractiveness, the Maiden's Blush has not been largely remunerative, because of its season forcing it on the market in competition with so much other quickly perishable fruit. The Winesap yields an entirely too large per cent. of under-sized apples unless abundantly nourished or irrigated, and Cooper's Early is not sufficiently hardy to withstand the sudden and severe changes incident to our capricious climate. This leaves the most highly-approved list of our orchardist composed of five varieties, three of which are the old, unpretentious, but reliable standbys, Ben Davis, Missouri Pippin and Jonathan, in the order named, with the Gano and York Imperial creditably bringing up the rear.

To me, as a Kansan, no horticultural or pomological statistics are more interesting than these of this Kansas apple-grower. The work done and the results it represents have not been wrought in some remote state, under conditions and with surroundings variant from our own, but well-nigh within sight of where most of us perform our daily tasks. The man who has done these things is no far-away character, heard of through some ancient legend or mythical story; not one who lived and loved and labored in another age; not a Cincinnatus, not a George Washington—not even a "grim chieftain," but our modest, peaceable neighbor; a plain, kindly, warm-hearted, manly Kansan of our time and our generation, and who believes in Kansas against the world. To name him would be superfluous. I salute him as President of the Kansas State Horticultural Society.

SECOND DAY.

Wednesday, December 11, 1895—9 a. m.

Called to order by the President.

SECRETARY TAYLOR'S REPORT.

When I saw in the daily paper a year ago that I had been elected Secretary of this Society, I could hardly believe the print. I had no desire whatever for the office, and had no intimations that anyone had thought of me in connection with it. Some of my friends had pledged the Society that if I was elected Secretary I would serve. I am serving vicariously; and would have done so personally had I not been unexpectedly fortunate in securing a substitute. When I learned that Mr. William H. Barnes, of Independence, Kas., had sold his extensive florist and gardening establishment, I at once offered him the position of Assistant Secretary. I had known him intimately more than 20 years. I knew that he was a good bookkeeper, a good penman, the best-posted all-around florist and gardener of my acquaintance, full of ideas and ready in expressing them with tongue or pen. Added to that, he had been in many enterprises both public and private, and had shown that he was able to take the initiative and hold his ground. There are men who can name more apples at sight and give the botanical name to more plants than he, but there are not many who can be more helpful in direction and advice to the horticultural neophyte than he. While I am entirely satisfied with the work of Mr. Barnes, I have not thought it fair to him to bring on an election for Secretary at this time by my resignation. Several considerations induce me to remain in possession of the office and hold myself in a position where I can, if necessary, have some active part in shaping its management.

The general line of policy to be pursued was agreed upon in a general council of war presided over by the President. Its main features were to get in touch with the local societies; to foster them; if possible to have one organized in every county; to revive an interest in horticulture throughout the state. As far as possible we desired to make the Secretary's office a sort of horticultural headquarters, not only for the dissemination of enthusiasm but also for information in its broadest sense, including plans, processes, methods, machinery, schemes of manufacture, transportation, marketing, either individual, corporate, or co-operative varieties, and every other helpful thing within our province. As far as our limited means, and the co-operation of horticulturists will permit, we desire to make the office a museum of fruits in their season, and of all the appliances for their production and harvesting. In many particulars we should be pleased to emulate the enterprise which distinguishes the state board of agriculture, but from which we are barred by lack of funds. For them the legislature appropriated (aside from the appropriation for compiling the census returns) \$7,900 for their annual use; for our annual use, \$1,435. They have unlimited rights of publication—our biennial report is held down to 100 pages. Should we prove faithful in looking after our one talent, I now bespeak your efforts in our behalf, with the next legislature for at least double the amount.

For myself, gentlemen, I can only say that I have been deeply touched by the spontaneous evidence of confidence you gave me when you elected me, without my knowledge or consent, to this important office. The position itself is one of influence and honor for which I had never thought of aspiring, but

the manner of its bestowal far outweighs the value of the gift. From my heart I thank you.

REPORT OF ACTING SECRETARY BARNES.

Mr. President and members of the Kansas State Horticultural Society: In making this, my first report, I would have you bear in mind that it is only 5½ months since I took possession, and that for at least one month scarcely anything was done, the retiring Secretary being too unwell to pack and forward the effects of the Society from Lawrence to Topeka. From the meager material at hand and a careful study of the past reports I began a voluminous correspondence throughout our own and sister states, to get in touch with the horticulturists of our country. I found there had been 63 district and county horticultural societies in existence in our state, but that they were now in all stages of life and death. I have made special efforts to encourage all of them. In doing this I have sent out over 800 letters, 600 postal cards and 1,800 circulars.

I have attended 13 horticultural society meetings and six county fairs; traveled 2,140 miles; have been away from the office 24 days, traveling much at night, and meeting with approval and encouragement everywhere. I found very active societies in Shawnee, Douglas, Franklin, Riley, Saline and Allen counties, and two in Labette county. In attending these county fairs I found horticulture placed at great disadvantage. While our horticultural interests are second only to our grain interests, yet I found, in taking 10 counties at random, that the amount of premium offered upon horses, cattle, and horse-racing, was over \$32,000, while on all horticultural products, fruits, vegetables and flowers, in the same 10 counties it was only \$786; an average of \$3,200 and \$78.60. Who is to blame? The time is ripe for a separation of "the garden of Eden" from the "chariots of Pharaoh." No interests in the world are more elevating or more necessary to the health and happiness of the world than those represented by horticulture, and few are more debasing than the race-course. How can they have interests in common?

The season just closing has been one of exaggerated expectations. Word went forth exaggerating the coming apple crop to such an extent that it affected the markets of the world. Then the Kansas zephyrs came and 25 to 30 per cent. of the best fruit was on the ground. When the final gathering came, it was found that the crop was not an extraordinary one in any way excepting in the great quantity of culls, reaching fully 60 per cent. of the entire crop. Pears in the eastern part of the state were never better, and in beauty and quality rivaled the famous California fruit.

Of new fruits, I would especially mention the new seedling peaches—that class that come true from the seed, and which there are reasons for believing are more hardy and surer to produce crops than budded fruit. In Osage county, Allen county and in Saline county I found these peaches and examined them. Wyandotte and Shawnee counties have each produced a seedling apple of great promise. It is among the possibilities for Kansas to furnish the world with a new line of valuable varieties of fruits. The new Arkansas or Mammoth Black Twig (Paragon) is a large, handsome, and I presume good-keeping apple. It has come to stay, and we hope to report more extensively on it next year.

The climate and soil of our state is so varied that while our state will grow in some part of it all the fruits known to the temperate zone and some of the torrid zone, yet all these fruits are not sure in all parts of the state. The

apple and pear are notably successful in the eastern part, yet the peach and grape are surer in the western part. Irrigation may change this. Berries are indigenous to our state, and were well known to the Indians.

In July we obtained a table and 60 China plates, and from that time to this we have kept a continuous exhibition of plainly-labeled fruit, which has been a source of pleasure and study to hundreds of visitors from nearly every state and territory, and some from abroad. This fruit came to us from several different counties; 50 or 60 lots of fruit have been brought to us for identification and name, and in nearly every instance, where the specimen was perfect and mature, we have succeeded. We lately obtained of the best lithographing company three books of 195 colored plates of fruit, as an aid to identification and as an instructive series to visitors. We know of no firm getting up fruit engravings scientifically perfect. They are gotten up to assist nurserymen to sell fruit trees, and sometimes valuable characteristics that do not happen to suit the eye of the artist are obliterated to make a more splendid picture for impression only. Yet as a whole, we will find them of much value. We have sent out 278 volumes of state horticultural reports, 92 volumes of forestry manuals, and 77 volumes of "Kansas at the World's Fair," and have received many volumes from abroad for our reference library.

It is our hope to get the fourth biennial (vol. XX) of Kansas State Horticultural Reports, into the hands of the state printer early in January. The edition is more limited than ever, being only 2,500 copies, limited to 100 pages each. We believe more liberal ideas must prevail at the next sitting of the legislature. We believe the interests of the new horticulture demand at least 5,000 copies, of 250 pages, issued annually, free from poetry, rhetorical flourishes, funny stories and chestnut reminiscences, and filled with the latest practical ideas and business. Our horticulturists spend millions of hard-earned dollars for horticultural literature, nine-tenths of which is either impractical or worthless. Our hope is that future reports may be the most valuable and practical horticultural text-books ever published.

Before we adjourn I will lay before you our hopes and aspirations for the coming year.

TREASURER'S REPORT.

State appropriations:	Dr.
Salary of Secretary	\$300 00
Freight and express	35 00
Expenses of executive board	100 00
Traveling expenses of Secretary	100 00
Postage, etc	200 00
 Total	 \$1,235 00

CR.

1894—July—Postage on letters	\$38 78
Postage in lieu of express	28 99
Packages, single copies, etc	15 00
Secretary's salary	66 00
	<hr/> 148 77
Aug.—Postage on letters, etc	\$10 25
Postage in lieu of express	29 80
Secretary's salary	66 00
	<hr/> 106 05
Sept.—Postage	\$22 00
Postage in lieu of express	6 25
Secretary's salary	66 00
	<hr/> 94 25

Oct.—Postage stamps, etc	\$16 00
Secretary's salary	66 00
	82 00
Nov.—Postage on letters, etc	\$15 25
Secretary's salary	66 00
	81 25
Dec.—Secretary's traveling expenses	\$7 95
Postage in lieu of express	27 85
Salary of Secretary	66 00
Treasurer's expenses for year	22 00
E. J. Holman, attending annual meeting	10 25
Samuel Reynolds, attending annual meeting	10 45
G. W. Bailey, attending annual meeting	18 93
Martin Allen, Vice-President, attending annual meeting....	18 22
	181 65
1895—Jan.—Secretary's salary	\$66 00
Postage	16 75
Feb.—Secretary's salary	66 00
Secretary's traveling expenses	14 20
	162 95
Mar.—Secretary's salary	\$66 66
Freight in lieu of express	10 25
Apr.—Secretary's salary	66 66
Expressage	9 30
Secretary's traveling expenses	21 16
	174 03
May—Secretary's salary	\$66 00
	66 00
June—Secretary's salary	\$71 38
L. Houk, annual meeting—President	15 11
Secretary's traveling expenses	2 40
F. Wellhouse, freights	6 54
	95 43
Total	\$1,192 38
Balance undrawn	42 62

All unused balances of state appropriations are unavailable after the end of the fiscal year, June 30.

Balance in hands of Treasurer received from memberships, \$91.

F. HOLINGER, Treasurer.

The President: At the last meeting, at Fort Scott, it was voted to move the Secretary's office to the state-house at Topeka. Myself, Senator Taylor and Mr. Holman were appointed the committee. Mr. Taylor and Mr. Holman were not present, and I took it upon myself to go to Topeka and made arrangements with the labor commissioner to place a desk temporarily in his room, and the Secretary's office has been there ever since. We started with a small desk, and were glad to get that. Now we occupy over one-half of the room of the labor commissioner, and he kindly gives way to us. We encroach upon his space. Senator Taylor introduced a bill in the last legislature providing rooms for us. The executive council are now talking of giving us large rooms, probably those occupied by the railroad commissioners. Those rooms will fit us out completely. Mr. Edwards, of the executive council, is here, and can probably give us some information as to whether we will probably get the railroad commissioners' rooms. The assistance we have in this direction is very gratifying.

SMALL FRUITS.—By Fred. Eason, Lansing, Kas.

Mr. President, Ladies and Gentlemen:

In presenting this compound subject to the representative horticulturists of the state of Kansas here assembled, I cannot help but realize my inability

to successfully treat it; but if I have one talent I will here undertake to use it in the interests of horticulture, hoping that others may help increase and develop the work so that talents may be gained by all.

God has given us a beautiful country, and has provided for us in many other ways. May we ever be mindful that God's provisions for us are our opportunities for a successful career in life's undertakings. It is said that opportunities do not make men, but measures them up and develops their true qualities. This is very true in the artificial world, but in the natural world, where the horticulturists exist, that declaration must be somewhat reversed, for here the opportunities are bountiful, and man must measure up to them, prove them up, and develop them, and then make use of them according to measurement, proof and development. If we neglect to measure the true qualities and value of sunshine, rain or the atmospheric influences on the soil, and we do not develop these opportunities, by the use of the tools at our command, but omit the use of cultivators at the proper time and are negligent in putting forth every effort to husband the resources given out by the excellent provisions of Nature's laws, we find ourselves then at the mercy of an unforgiving Nature. She will not return good for evil. If we strike her at an unfavorable time, she will strike back at us in an unfavorable time, and we will be humbled and despaired, while she retains her dignity and remains undismayed. We are sometimes led astray by theorizing too much, and hoping that the mind will lead us through without any physical effort on our part.

We should not expect to reap where we have not sown. We are very apt to measure theory with an air-castle rule, and imagine that we may gather where we have not planted. But as air-castles are an illusively luminous product of the mind, they should be avoided by one who wishes to grow small fruits. They are applicable only to the one who neglects to cultivate and care for his fruit plantation and then expects to gather a bountiful harvest. Such persons will meet with dismal failure, and will find themselves without even a "castle in the air." A great amount of labor must necessarily be performed in any department of industry to make it a successful undertaking. Yet labor has its proper reward in each department, and it seems to be more thoroughly demonstrated by man's contact with the soil, and more beautifully illustrated by the results thereof than in any other department of life's pursuits. There are new beauties constantly developing and rising from the musty forms of earth, and when touched by the crafty hand of man earth's lilliputian beauties rise as if by magic until they become magnificent giants, overshadowing some of the more stately forms.

We as growers of small fruits are sometimes surprised at the accomplishments of the season, and wonder at the splendid results we have secured, and we feel proud that we are engaged in such an attractive occupation. The coming of the season of small fruits is the expectant happiness of every household in America; and when the season is full upon us many families are made happy by their abundant use. In growing small fruits I find it is best to begin cultivation a year before setting the plants, by plowing, cultivating and thoroughly pulverizing the ground. More grass and weed-seeds can be gotten rid of in this way than in two or three years' cultivation after the plants are set. The ground should be in such a condition as to insure the growth of the plants without any special attention until their roots are firmly grasping the soil, and at this stage the small-toothed cultivator-harrow is an important factor, as well as the liberal use of the hoe. Shallow cultiva-

tion is in order among small fruits, and if the ground has been well prepared the year before your attention can be almost exclusively given to the growth of the plants; and the results in plant-growth will be far superior to those where nine-tenths of your time has to be given to the destruction of weeds and grass. It is important to the success of the fruit-grower to secure a fine growth of plants the first year, especially so in cane-fruits, for if the first year results in a sickly growth the chances are largely against a crop in future. The same may apply to strawberries, for from most of the varieties we expect to gather our best crop the next year after setting, and in order to do so we must grow healthy, stocky plants, and cultivation is the only thing that will produce them.

The natural soil of Kansas is rich enough for nearly all kinds of fruit, and with proper care just as fine plantations can be grown here as anywhere in the United States, and with just as good results. The greatest mistake I ever made in growing strawberries was in getting the ground too rich. I secured a magnificent growth, but they were so rank that one would think they were some kind of fodder-plant, instead of strawberry-plants. It is needless to say that I did not get any strawberries. But I can say that 25 years' experience in growing small fruits will cut a good many eye-teeth, and that the failures and successes of the past combine to make the horticulturist a practical and successful inhabitant of Kansas.

Marketing.—There is nothing more sublime to the fruit-grower than to view a beautiful plantation of small fruit, loaded with handsome ripe berries, produced by his own efforts. It is then that he can fold his arms in solid satisfaction, and dream of new fields and richer conquests. But this dream cannot last long. Such enchantment must resolve itself into a practical and energetic activity. The marketing is now at hand. Money is the keystone that supports the arch of the market door, that stand open from May to November; and without this one very important factor the arch will collapse, and fruit-growing will only be visionary as to the financial results. It very often occurs that distant markets must be sought on account of the oversupply in our local markets. In dealing with distant markets the berry-grower must be very cautious. He must first investigate the demands of that market; second, secure the very best firm there to handle his fruit; third, send them the very best at your command. Right here we might say that the beginning of good shipping berries is in the picking. More good fruit is ruined in the picking than in any other way. Eternal vigilance among the pickers is the price of good fruit for transportation; and berries well handled in the picking are half sold in the distant market. It is also advisable to avoid markets where transfers are necessary, for transfers are death-dealers to small fruits; the crates are generally handled without any care or thought that the slamming they are given will ruin the sale of the fruit, and that when it reaches its destination it will hardly bring express charges. I have often found this the case. I have shipped berries to different markets on the same day, one shipment going straight through without transfer, the other being transferred; the one bringing good returns, the other proving a loss. I could account for it in no other way except in the careless handling, the fruit having been gathered at same time and handled under like conditions. Taking and considering all natural circumstances the fruit should have brought just as good returns in one market as in the other. But in this day of quick transportation competition is very close in the berry market, and it sometimes happens "though however careful we may be" our shipments prove unprofitable. I think we have a tendency to hug the larger market too close, and hurl our fruits at

each other in these great centers of fruit commerce. We sometimes forget, in our eagerness for profits, that even our own shipments will come into competition with themselves if we push too rapidly into a hitherto profitable market. If we throw ourselves too lavishly into open market we will be tortured upon the rack of "account sales of burning losses," which is very trying to anyone. We should exercise care and caution, both in local and foreign markets. The handling of fruits is the vital consideration in marketing. Careless handling is dragging the fruit banner of this Western country in the dust. We see it trailing upon the streets of every city, crying out "Perishable! perishable!" We see it in mourning at the open door of the commission house, placarded "This must be sold." We see it torn, drooping and dripping its rich colors from the wagon of the street-hawkers. It has been ruthlessly handled, trampled under foot, and mercilessly treated, and as a last resort thrown upon the street in a mutilated condition. No wonder there is financial loss in fruits when such conditions exist. Let us make an effort to lift high the banner and wave it proudly. This will be more effectually accomplished in the field than elsewhere. I have had pickers who would bring in fruit from the vines that was absolutely worthless, except for vinegar; and I have seen fruit unloaded in the local markets that was unfit to go upon the stand for sale, and it had not been picked two hours. Brother fruit-growers, every berry that you allow to be picked before it is ripe and every one that is broken and mashed in taking from the vines is a direct loss to you and an indirect one to your neighbor. This should be remedied. Look after the picking closely. Do not tolerate careless handling in any particular, and then we will be better able to reach a high standard and have a consciousness that our work has been well done, and we may expect returns that will pay us for every effort.

Small fruits are the brilliant gems set in earth's diadem, and flash from orient to occident, blending their colors with many fair settings of greater magnitude and less brilliancy, thus beautifying man's earthly ambitions, leading on to brighter hopes, richer experience and new zeal to produce more of these precious gems.

SMALL FRUITS.

B. F. Smith, Lawrence: Looking back over this year's experience, I see, in the beginning, an unusually dry spring; so dry, that to remove and set strawberry-plants was a hazardous undertaking, and the few who did lost more than half their plants. Then, near the middle of May, I see a severe frost, with continued drought, blasting many of our berry-patches. The few strawberries that the frost did not get made a poor showing toward a profitable crop. At the beginning of every season come new problems to solve. Past experience does not suffice to guide in the beginning of a new year's work. The programme must be changed to suit each season; and yet, we work largely in darkness, trusting to the general outcome, whether it be a prosperous or an adverse season. Every year brings new inquirers for advice in berry culture. The low price of farm products causes a few farmers to go into small fruit-growing. They rarely stay, as the low price of berry products drives them back to farming. Hence, there is a continual tide of wavering cultivators of the soil, ready for a change at every low tide in products or prices. I am often asked, "Will berry growing pay?" To the patient, hold-fast fellow there is a living in it. I believe periods of adversity are educators, but they are rarely told. It is the successful actors whose stories are more frequently

told, while clouds of educative adversity were just behind them. I see to-day as great opportunities in fruit-culture as there were 30 years ago. The berries that gave me greatest satisfaction in product and profit were, first, Captain Jack and Warfield, equally matched; second, Robinson, Parker-Earle, Windsor Chief, Crescent, and Gandy, about equal in product, but varying in size; third, in product and profit, Bubach, Glendale, Parry, Haverland, Miner, Jessie, and Bederwood. Another season may change the relative values of above sorts. Of newer varieties my first choice is Paris, King, Muskingum, and Saunders; second, Splendid, Princeton, Princess, No Name, Gandy, Bell, and Rio. The most promising novelties to bear next season in plant-growth are Bissell, Brandywine, Cyclone, and Aroma. The earliest are Michael, Bederwood, Van-Deman, Barton; longest in bearing are Bubach, Muskingum, Gandy, Paris, King, and Jessie. Windsor Chief, Gandy, Glendale, Mt. Vernon and Robinson are the latest from which I gather. I hope for good results from novelties to fruit next year. Berry-growers are eager for a sort of superior size; then for a firm and medium size, that will carry well. Some fruit-growers object to so many new sorts being introduced. As long as consumers demand the best, fruit-growers will strive for perfection. Testing new fruits is a fruit-grower's duty, and it adds life to the experiment stations. The enterprising fruit-grower should work upward into light. Raspberries paid well this year on uplands, as the rains came in time to save them. On low bottom lands, away from the river, they were about all killed with frost. The most satisfactory black sorts were Progress, Kansas, and Queen of the West. On account of the earliness of Progress and Kansas, better prices were obtained for them. The later sorts brought lower prices. Our city and nearby markets were not well supplied with red sorts. Prices of reds ranged from \$3.50 to \$4 per crate. Blackberries ranged lower this year than for several years, owing to largeness of the crop and low price of peaches. Our best blackberries are Taylor and Sandy. Early Harvest is profitable to grow for distant markets. The plum crop this year was immense, but prices were so low they hardly paid express charges. The season of 1895 was not a very successful year in Kansas with small fruits, owing to drought and frost reducing the product, and the 10 days that northwest Arkansas continued to ship berries after our berries were ready to market.

J. F. Cecil: My success in strawberries the last year or two has not been very good. The dry fall this year particularly, placed some of them in bad shape, and caused rust to strike my old bed. The new bed is in good shape. I have no remedy for rust on strawberries. I would like a remedy for the anthracnose on raspberries. It troubles us much. Some varieties stand it better than others, and are more free from it. I think the heavy land more free from insects than light soil. Raspberries and strawberries were profitable this year. Blackberries went to pieces in a few days.

B. F. Smith: Twenty years ago I set a raspberry patch; it fruited 10 or 12 years. Since this trouble with anthracnose four crops is all we can take, and then we have to pull up and plant anew. There is a similar trouble with blackberries. It will not pay to run blackberries over five years. In regard to strawberries, set your plants in the fall and early spring; early spring gives the best crop. Hardly a year but I have 40 letters inquiring, "Can I plant strawberries in the fall and get a crop the next year?" It is impossible. Some want to plant to-day and pick to-morrow. You have to wait for strawberries to root, in the first place. When you set the plant out it has four or

five roots. Trim the runners right away. That one little plant set in the fall, if not frozen out, will grow three or four good berries.

Fred. Eason: With regard to the anthracnose, I have watched the raspberries and blackberries on my farm, and kept them free from insects by using the sprayer. The way to prevent anthracnose is to dip the whole plant right into a solution of Bordeaux mixture. That will kill them. The liquid solution seems to give life to the plant, and to be a good fertilizer. Some say this is just a rust and easily rid of; but that is a mistake. I have been careful to plant nothing that had lice or anthracnose on it, as I am certain it is transferable. For the last two years, at least two-thirds of my strawberries were raised from plants set in June, July and August. In other words I set out the first runners from plants set the fall previous. None yield like Parker-Earle. I had three acres in strawberries last year. I sold over \$234 per acre, and they netted me over \$181. This year I had four acres, largely same varieties, and they netted me a little over \$185. Generally it is recommended to change your ground, yet I grow them continually on the same ground. I have had these berries on the ground four years. I have no old plants to raise fruit. When they get through fruiting, I cut them out each way to three feet apart. If we do not find good healthy plants within three feet, I cut out to four feet. We have to train the first runners some. Soon there is an abundance of plants and they are healthy. We cut out the original or old bed.

J. C. Evans: I am more of a large than a small fruit-grower. One point struck me, and that was the over-production of small fruit. I think that a mistake, and Mr. Smith's paper will bear me up in that. We never had an over-production of fruit. We have shipped blindly. I ship to a certain man, others ship there also, soon the commission-man has a lot to throw away. Thousands of people, men, women and children go hungry for fruit, yet they dump much into the river. We should distribute fruit to points needing it. This is more important than varieties. The matter of organization and co-operation is an important thing to fruit-growers. Varieties should be dealt with in our papers so we can get it from the reports. We should not take the time of the Society to go into details of varieties and diseases of the plants. Write them up and put them in our papers to have when needed.

A. Chandler: I have been growing small fruit successfully nine years. I planted strawberries during the dry spring of 1895, and lost not over 1 per cent. I sold last year \$160 worth from 36 rows of Warfield and Robinson. I sold for \$4.50 a crate. Raspberries averaged \$1.50. Blackberries I sold at an average of \$1.10, which with the yield I got gave a fair profit. It beats farming at present prices. The Kansas I think is our best raspberry. I first marketed one or two crates a day; now it takes three wagons to haul one picking. The ground is a hilltop near the Kaw river. We have cleaned off the brush and planted as we could. The results have been marvelous. I have sold \$2,000 worth in one year. This year the yield was fair. The land slopes in every direction, and it is not a desirable place for farming, while fruit grows very successfully. My raspberry plantation is about 10 years old—principally Hopkins and Gregg. I have planted the Kansas and some other varieties that are promising. I will discard the Hopkins; it is unprofitable. I have six acres in Souhegan and Taylor, and they can be relied upon. I think root-cuttings most desirable. I plant principally in spring.

W. H. Barnes, Acting Secretary: We lack knowledge of just where to ship. It has taken me 15 years to find it paid to use extraordinary care and fore-thought in this thing, and I have felt like kicking myself many times when

the returns came in and I found that I had sent perishable goods to an over-stocked market. I found that with fruit picked the same day some brought good returns, others hardly paid express. I have made a good deal of money by not shipping where I wanted to ship. A telegram costing 50 cents will find out just how the market is. You who have never raised perishable fruit do not know what it is to find yourself with 100 crates of strawberries, and more coming, and not a crate positively ordered. Talk about a lawyer bothered with more than he can get through, and clients still coming; it does not compare at all. The express company have their hour for taking it, and the train goes at a fixed time, and this stuff must go. The growers of perishable produce ought to combine in each neighborhood, and arrange with the telegraph company to keep them posted all the time on the markets. You cannot rely on the regular market reports; they put the market at a price to-day, and to-morrow it is not so. I found after 15 years' experience in shipping that the best friend I had was the telegraph company, and have saved a great deal by it. I have telegraphed at same time to Nebraska, Colorado and Iowa, and made up my mind in five minutes where I would send—but not always where I wanted to; but I sent where the market was good. There is money in using the telegraph, every time.

Dr. J. Stayman: I have planted strawberries in the fall many years. The winds satisfied me that it did not pay. Early spring is the only time to plant here. I have had Parker-Earle ever since it has been in existence, and raised but one good crop of it. It is only adapted to certain seasons. If there comes heavy rain and hot weather, they scald. Do not plant a variety that rusts. I brought the Wilson to this country in 1860, and they were a failure. First get the right kind; next plant out early in the spring, in soil prepared properly. I never had a paying crop of Bubachs.

President: I notice the Honorable Secretary of State is present; and everyone knows "Billy Edwards." We would like to hear from him.

Hon. W. C. Edwards, Secretary of State: It affords me great pleasure to meet with you to-day, as I have been interested in horticulture since boyhood. Back in Pennsylvania, when a boy about eight years old, I remember taking a sack and going to a neighbor's three or four miles away and getting some shrubs. I also put out a young orchard of pear-trees, and when they began to bear I remember what the pleasure I got from them. My first act in Lawrence was to put out a fruit-tree, and blackberries and raspberries; and when afterward I changed my location in the town I had no place there to grow trees, but I had a plenty of strawberries, blackberries and raspberries; and, to-day, I have in western Kansas I think some fruit that will favorably compare with other fruits of the state. Western Kansas fruit-growing is in its infancy, and we are learning year by year how to grow fruit there. In my judgment it will become one of the greatest horticultural parts of this state. I think it will produce small and large fruit in abundance in the near future. I believe 55 per cent. of the lands in western Kansas are not cultivated. We will soon see a population of thrifty and energetic men there. We grow large sections of wheat. In 23 years I have had 4,300 acres of wheat. This has averaged 15 or 20 bushels to the acre. We have had a surfeit of wheat, and left the smaller interests. The people of western Kansas are now getting the idea of fruit-growing largely. We can grow all small fruit and apples, peaches, pears, plums, etc., in western Kansas. In Garden City they demonstrated that fruit-growing is a success. We have a fine onion-field around Larned. I want to say that your representatives who go to the legis-

lature should be impressed with the fact that your Society has never made as big demand as it might have done. You should impress upon your members that you need something. You must impress your needs more forcibly upon your members, and bind them to push your interest. You want to impress the legislature next year to make suitable appropriations for your needs, and be heard. There are the appropriations that have been made for the Hutchinson reformatory, the appellate court, and irrigation—all their needs have been pressed this year upon the committee, and yours should be. This state should appropriate \$100,000 for the printing needs of the state in the various departments. I am glad your new quarters at the capitol are going on nicely. I have arranged with the railroad commissioners for them to occupy the east rooms, and am very glad to say your Society is being protected and having rooms fitted for them. While the railroad commissioners have requested we would give them the supreme-court rooms, I am for giving you the railroad commissioners' rooms. In about three months, at farthest, you can have these quarters. We should be able to have them earlier. We have a contract which agrees to have the work done as early as the 14th of January, but there have been delays. The work is getting on nicely now, and I am very glad your Society will have the rooms of railroad commissioners, where you can display your fruit; and I shall take pleasure in sending my friends to see you, where they can meet your Secretary, and can experiment themselves. I am pleased at the wonderful show made, and am very glad to be with you, and came on purpose that I might show you, as one of the persons in your confidence and trust, that we are interested in you; and I believe we ought to take more interest. And I believe when you elect men to office that you ought to have them pledge their support to your cause, and make them stick to it and do what is expected of them.

W. H. Barnes, Acting Secretary: I would beg the indulgence of this meeting for a few moments at this time. I do not think any time more appropriate for me to say what I would like to say in response to the expressions that Mr. Edwards, the secretary of state, has uttered just now. I came to the state-house, representing the State Horticultural Society, with Mr. Wellhouse, a total stranger to all the officers of the state. They have treated us most kindly, and now I feel at home in the state-house. They were very kind to us, especially the secretary of state, state auditor, secretary of the state board of agriculture, and the governor. They express the warmest interest in the State Horticultural Society, and frequently visit the rooms and admire the fruit displayed, and express a desire that we have larger quarters. Early in the coming year we hope to be comfortably and conveniently settled in well-furnished rooms in the state-house as a permanent home for the Society. There, we hope to enlarge and place in convenient cases our library of reference, completely indexed, so we may follow a single subject through different and differing authorities. We hope to set on foot a movement to obtain and keep on hand for public inspection a case, or cases, of mounted and preserved insects peculiar to horticulture, with descriptions of habits and best modes of destroying; also to keep on exhibition samples of insecticides, fungicides, and the instruments for applying the same; also contrivances for trapping and killing insects injurious to horticulture; to keep on exhibition models of traps, protectors, pruners, pickers, sorters, dryers, parers, corers, bleachers, labels, tags, time-cards, picker's checks, plans for keeping accounts, plant-stakes, trellises, dibbers, trowels, pots, planting and transplanting devices, seed-pans, etc., with diagrams and plans of cold-storage plants, irri-

gation works, fruit-drying kilns, greenhouse, hot-bed and cold-frame construction. We hope to improve our fruit display, and to keep a special record of all fruits received, with the date and condition when received, and by weekly examination note and record their keeping qualities. We intend to put much fruit in cold storage, and when taken out will note particularly their after-keeping qualities, and record the same. We shall increase our fruit plates, of which we now have 195, and try to keep track of the new fruits as offered, believing we can thus protect hundreds of our horticulturists from imposition or expensive trials. We hope to see organized over 50 new county and district horticultural societies in our state, and hope every one of them may hold a successful horticultural show next autumn, and that through the state society each may keep in touch with the other. We hope to prepare a monthly communication, suited to the seasons, to be read at the regular meetings of every society, thus keeping in close touch with all, and aiding them in keeping abreast with the times. We hope to make the rooms of the Society a Mecca for horticultural pilgrims from every clime—thus doing our part toward educating the horticulturists. In a late conversation with His Excellency, Gov. E. N. Morrill, he expressed himself something like this: "Our state is now entering on a grand horticultural era. Our people have been overlooking these things as too small. When we have a million more settlers, and New England thrift takes hold of horticulture here, we will then be in the lead as a horticultural state." And I believe the governor is right; and the Kansas State Horticultural Society is going to help bring this about. We cannot do all these things at once; the appropriations made by the last legislature are too meager and insufficient. Another annual meeting will be held before the legislature meets. But we will study and plan, and when they do meet, they must surely appreciate the value of the State Horticultural Society, and be ready and willing to appropriate sufficient funds to keep our Society marching on at the head of the world's horticultural column.

Dr. J. Stayman: I want to call attention to the extensive programme which Acting Secretary W. H. Barnes has read us, and to emphasize Secretary of State Edwards's remark that all this takes money. It takes money to make a fair good, and money to run an office of this kind. Gentlemen, the last legislature appropriated for this Society \$1,430, and for the state board of agriculture \$7,330. That is over \$5 to our \$1. This is only a fraction of the money this office ought to have to keep up the constant supply of fruits and suggestions of Acting Secretary Barnes. It is of great value to horticulturists, and it ought to be provided for, and that takes money. When the next legislature meets let every man get hold of his representative and make them promise us support. A man will promise anything when running for office.

G. Y. Johnson: The turn matters have taken with the State Horticultural Society are especially gratifying to all the old members. Judge Wellhouse and myself, at another meeting, were the only ones favoring the State "Board of Horticulture." No great noise about it, but no occasion was let slip to bring this subject forward, and I hope every member will follow the suggestions, to do the right thing at the right time to secure the best results.

AFTERNOON SESSION.

Wednesday, December 11, 1895—1:30 o'clock.

Called to order by the President.

IRRIGATION WITH STORM WATERS.

By Hon. Geo. M. Munger, of Eureka, Kas.

Irrigation with storm waters may be fairly interpreted in this instance to read, "Irrigation in Eastern Kansas." Apathy and doubt regarding the benefits of irrigation exist in this portion of the state, while in western Kansas a vigorous, active development is well under headway. About one-third of the state, and that the eastern third, is more or less irrigable with impounded storm waters, and in no other way is it possible, leaving out of consideration the comparatively limited areas of river and creek bottoms. The geological formation and topography of this part of the state are eminently favorable to this plan of getting and using the water. The land system and ownership are against it. Lands were originally surveyed, platted and sold without any reference to this important feature of a successful agriculture, and there has been no material change. The system takes no cognizance of topography, but solely the ease of dividing into convenient rectangular tracts. It is probable that no more awkward or ungainly method of division could have been adopted. It commonly occurs that an owner having a suitable location for a reservoir for accumulating and holding water will find the land most easily irrigated from his reservoir owned by a neighbor. The resultant inconvenience is evident. The cheapest and best way to distribute water for irrigation is by gravity, and in those cases where the reservoir site is higher, and lands to be irrigated lower, and both owned by the same party, the problems are not difficult of solution. On the other hand, where the water will be below the irrigable lands, the lifting of it becomes a problem of first importance.

This irrigation may properly be divided into three prominent parts. The first, the means of reserving the run-off or waste waters; the second, the methods of getting them onto the land, and the third the distribution. With a clay subsoil, as obtains in nearly all of eastern Kansas, there are but few difficulties to be encountered in the making of earthen dams that will not only hold water, but that will stand for indefinite periods, provided the dams are properly constructed. Too great importance cannot be attached to the doing of the preliminary work thoroughly. Especially is this true where considerable bodies of water are to be retained. A reservoir should be planned with reference to its watershed to as great an extent as possible. In nearly all cases it will be found that the watershed is too large rather than too small. The difficulties increase rapidly in cases where there is too great a shed for the purpose, owing to the necessity for providing suitable spillways for the surplus water in periods of excessive rainfall. A watershed of about 10 times the area of the proposed reservoir is about the ideal proportion, while a smaller would be preferable to a larger.

In the construction of an earthen dam, the first and important work is the clearing of the base of the sod and the surface soil, getting down to the clay subsoil before beginning the superstructure. The next work to be done is of great importance to dams that are to retain water to a depth of 10 feet or over, while in smaller works it is not so imperative. This is the construction of

permanent drains in the base of the dam, for the purpose of carrying off the water that inevitably seeps through newly-moved earth. These drains should be placed about the middle of the dam, running lengthwise of it, and if the dam is to be a large one, two or more of them running parallel will be desirable. The effect of these drains is to keep the superstructure dry by allowing the seepage to pass out as rapidly as it comes in, and thus relieve the work of the danger of being saturated, in which condition its stability will be greatly endangered. An important item in the selection of a site for the dam is that there be no rock encountered in the foundation, for so surely as it is, just so surely will there be a leakage between the rock and the earth. A leakage will inevitably cause regular channels, while a seepage will not. In case of finding a strata of rock in the foundation it had better be abandoned. The proper foundation for a dam is of even more importance than that of a building. The next step will be the opening up of the borrow pits, and these should be treated the same as the base of the dam—that is, all the surface soil removed. This surface soil removal is not all waste, as the earth can be successfully used on the rear of the dam, while it is undesirable on the face. The most impervious earth will be the clay subsoil, and the least the surface soil. The ideal earth for this construction is clay with a moderate proportion of sand or fine gravel.

In building the superstructure it is better to put the earth on in thin layers, that it may be well packed by the tramping of the teams and tools. About one foot, and not more than two, will be the best for results. The slopes are most easily built at such angles as the earth will readily stand, and the action of the elements may be relied on to produce the proper slopes on both face and rear of the dam. The top of a dam of any considerable size should be left wide enough and to spare to allow of the use of teams and tools for the repair of the inevitable settlements which will always be the greatest at the heaviest parts of the work. A width of 10 feet on the top of a dam is considered absolutely necessary, and 20 feet is better. In case of the narrower width on top, team-work will be necessary to effect temporary replacements of settlements, while if the greater width is allowed, replacements can be made with earth already on hand and under conditions that will not permit of using teams; that is to say, it is an extra safeguard.

Our state law has taken cognizance of this matter and attempts to regulate the width of dams of given sizes; but the laws of nature are superior and will more than meet the requirements of the case. Large dams will require several years or especial and expensive treatment to attain their permanent form and condition. Earthen dams will not allow of water passing over them, and it is dangerous to attempt to provide spillways through them. The best and cheapest plan is to build the dam enough above flood-line to insure safety, and allow the waste water to spill around the ends of the dam, and, if possible, over unbroken sod. For dams that are to retain water to a depth of 10 or 15 feet, a margin of three feet above flood-line will be safe, and for those above that not less than five feet is allowable. One of the most vital points for safety is the adequacy of the spillway.

At the final completion of the dam, a facing of the water side with riprap will be an economy in preventing the further loss of earth by wave action. While this is not always absolutely necessary it is very desirable. It is considered very objectionable to allow any piping through the body of the dam, and if done will be the weakest spot. To take the water out by means

of a syphon is an easy matter and better—that is, supposing the water is to be used below the dam.

It probably will not be desirable to enter into any detailed discussion of the various methods of lifting water, but there are three motive powers—Wind, steam, and gasoline. Of these the wind is by odds the cheaper, the steam the most reliable, the gasoline yet on trial. The experience of users of gasoline this year has not been such as to encourage them greatly in its use, owing to the doubling of its price about the time its use began to be considerable. Wherever and whenever the centrifugal form of pump can be made to do the work it is likely to be the most satisfactory of all known forms. There is no motive power known so cheap as the Kansas winds, and while there are many forms and styles of mills, the perfect one for work has not yet been perfected, or at least recognized. A crude but exceedingly effective mill was recently exhibited at Garden City, and the principles and methods are likely to be developed. It hardly seems probable that large areas under single managements will soon be irrigated by the use of wind-power, yet it is not too much to say that it is easily possible. More extended studies of the possibilities are well worth the time. Simplicity, cheapness of construction, large capacity, a construction that will permit of home repairs, and a reservoir system to make a balance, are all items to be carefully considered.

Nowhere in eastern Kansas is it likely there are to be found any insuperable obstacles to distribution. Water will readily run down hill, when given the opportunity, and in most cases is given to running a bit too fast. This difficulty in distribution on lands with stiff slopes is overcome by the use of artificial drops or falls, giving the spaces between the proper grade, which is usually from half an inch to an inch fall to the 100 feet, but no exact grade can be given without fully understanding the character of the soil. An inch fall to 100 feet makes a pretty stiff current—too stiff for most lands. There are two general systems of distribution of water on land, one by flooding the other by means of furrows. Both have their respective advantages in their proper places, and both will be used on different crops as may be best. Whoever contemplates the use of water to irrigate his land will be compelled by force of circumstances to enter into the study of details much more fully than is possible within the limits of this paper. These matters are all treated of extensively and comprehensively by the various publications of the national government, and these may be obtained from Washington easily and without expense.

That we may know something of the class of work under consideration, it is well to make some investigation as to what has already been accomplished by others in this line. In the twelfth annual report of the United States geological survey is contained a very full report on "Irrigation in India," by Herbert Wilson, C. E., who was sent there for this purpose by the government. From page 536 to 553 of that report is a vast amount of information on the subject of this paper. In that report Mr. Wilson defines the difference between reservoirs and tanks to be the difference in the construction of the dams. A dam made of masonry creates what is called a reservoir, while a dam made of earth makes what is called a tank. Since there is little probability of masonry works being soon used on this class of works here, we will continue to call them all reservoirs. Mr. Wilson makes the statement that "in Madras presidency, including Mysore, there is said to be about 75,000 tanks." Also, "in Mysore, early in 1866, Major Sankey reported that the percentage of the whole area of Mysore under the tank system was

59.7, while the total area of the state is 27,300 square miles." Also, "in the Madras presidency mainly, exclusive of Mysore, there were reported in 1882 to be 53,000 tanks, having about 30,000 miles of embankments, and 300,000 separate masonry works, weirs, escapes, etc., yielding a revenue of \$7,500,000 per annum, and having invested in them a capital of \$75,000,000." With these statements before you from so excellent an authority, it will easily be seen that the science of irrigation by the accumulation and use of impounded storm waters is nothing new. This system has been in use in India, as stated in this same report, for "hundreds of years."

When the statement is considered that the system in Madras has paid annual revenues of 10 per cent. on capital invested, there need be no further question as to whether or not it paid.

That it may be seen what has been done and what expense incurred in lifting water for irrigation purposes, reference is had to a French work, "Irrigation in Egypt," by J. Barois, principal secretary to the ministry of public works in Egypt, and translated by Maj. A. M. Miller, United States army. Many different styles and methods of lifting water are described, many of them involving human power, while wind-power seems nowhere to be used for the purpose. The lifts are usually quite moderate, varying from about 6 to about 30 feet. Of the steam-works, some are of the most massive and powerful of any lifting machines in the world; while still larger numbers are of moderate capacity. Barois states that "there were in 1882 in the whole of lower Egypt, 2,500 machines, representing a total of 25,000 horse-power, among which 360 machines have a total of 6,000 horse-power." "In upper Egypt there are in all 150 machines, representing 4,700 horse-power, among which there are 56 permanent machines with a total of 3,600 horse-power." The province of Behera, which is the most westerly of those situated in the delta of the Nile, is irrigated by two principal canals, both of which are supplied with water that is elevated by steam-power, the two plants doing the work being located, the one at Atfeh, the other at Kataibeh, and in 1884 these two plants delivered during the season of irrigation 4,000,000 cubic meters per day of 24 hours, this being about equal to 3,220 acre feet—that is, the amount of water which would cover 3,220 acres to the depth of one foot. This will give an idea of the enormous quantity of water required, and is sufficient to demonstrate the fact that lifting water in large quantities for irrigation is not a new idea. The steam-plants that are used for this work consist of batteries of boilers, 10 in one case and 11 in the other, each boiler having a heating surface of 190 square meters. It is to be considered, also, that this work is all done for agricultural purposes and not for especial high-priced products, and that the products, sugar, wheat, cotton, etc., are such as come in direct competition with the products of the world. The work is done by a company under contract, and the importance of it will be understood when it is stated that the forfeiture for stoppages is placed in the contract at 26,000 francs per day.

After all, this question of whether or not it will pay is the vital one to be considered. It hardly seems prudent to assert that corn at 15 cents per bushel, or wheat at 40 cents, will pay for or warrant the installation of an irrigation system, but in considering irrigation as an aid to horticulture, there seems to be small hazard in recommending it.

Should a man obtain by irrigation a yield of 100 bushels of corn per acre, and then get 15 or 20 cents per bushel for it, he could not be said to be gaining rapidly, at least; but if a man has a bearing orchard that is yielding an occa-

sional crop of from 50 to 100 bushels per acre, and out of that one-half to three-fourths must class as seconds or culls, and by irrigating that orchard he can increase the same fruit so that it will measure three times as much and all grade "fancy," without any culls, it is easy to see that at any prices for fruits that have been known to prevail this man could easily afford to expend a very considerable amount per acre to install his irrigation. Then should it so be that in place of an occasional crop, the irrigation will produce for him regular annual crops of this same class of fruit, it will require no bookkeeper to discover that it is profitable. If the water running down the Kaw should be applied to the potato crop that is so successfully grown along its fertile bottom lands, and should the result be to double the yield, it would not be necessary, ordinarily, to ask if it paid. Those suppositious advantages are shown by the experience of irrigators to be quite within bounds and conservative rather than extravagant.

This autumn apples were sent from the Grand valley, in Colorado, to show what irrigation can do and actually does there, and the Wagners weighed 14 ounces and Rome Beauty 15 ounces. More than this, it is positively stated that in picking there is little need of sorting, as everything grades "fancy," and faulty fruits are practically nil.

The question is asked, "Is the quality of apples and other fruits grown under irrigation equal to that grown under natural conditions?" The answer to that question is, when you select fruit to eat, do you prefer the stunted, gnarly specimen, or the well-grown, perfect one? If you had your choice of beeves for slaughter, would you take the stunted specimen that the feeder would reject or the well-fatted animal? It is the invariable rule that the full-grown, well-developed specimens are the best in every way, whether beef, apples or corn. Yet the fact remains that the differences between a large, fine and well-developed apple and the reverse is mainly water. Plants of all kinds can only grow and thrive with an adequate supply of water, as the mouths or valves of their feeding roots are microscopical, and in many if not all plants these small roots are themselves invisible to the naked eye. The condition requires that all their food be in absolute solution, no other method of getting sustenance being possible to them. Plants must have water to do their best, not only in plenty but at all times; and it is as necessary to best development as it is to the fattening steer, the difference being that the steer can call attention to his wants and enforce attention while the plant will suffer in silence.

Here is a quotation from the Denver Field and Farm of late date: "The poorest apple crop in Colorado this year is that from the Stark Brothers' dry orchard, in Arapahoe county. The yield from nearly 90 acres of nine-year-old trees is but 850 barrels of marketable apples. It is time for the Stark Brothers to begin the realization that apples cannot be grown without irrigation in Colorado."

Pres. W. B. Felton, of the State Horticultural Society of Colorado, reports, "five acres in winter apples (mostly Ben Davis), \$1,155 per acre." Two exceptional yields were reported in the same paper, but the conditions were abnormal.

A Mr. Shropshire, living in Colorado, owning a small orchard, was offered \$800 per acre for it, and answered that he made that much annually from it. Messrs Tibbetts & Sons, having a 100-acre orchard near Grand Junction, in the Grand valley, were offered and refused \$40,000 in money for it, or \$30,000 for a choice 40 acres of it. These are all young orchards. Statements like

these should call the attention of the Kansas fruit-grower to the thought that there is something he has not yet discovered in fruit-growing. It is not very difficult to show that the lack is almost exclusively water.

Sub-irrigation has been discussed more or less in the public prints, and in some cases with considerable vehemence. It is sufficient to say, that according to government reports on the subject, the practice has been thoroughly tested in southern California by fruit-growers and condemned. The Utah experiment station has also recently issued a report on the subject, and the following is an extract from the summary: "The experiment covers 10 trials, and in every trial but one the surface irrigation gave the highest yields. The system is so expensive that it is doubtful whether it could ever be applied to general farming." The quantity of water required is an important part of the subject, and as bearing on that point, the following extract from an editorial in the Greeley Tribune of January 31, 1895, on the duty of water and its results over large areas, is of interest: "Whereas the Larimer county ditch has just half as many acres under cultivation in Weld county as has canal No. 2, it produces a trifle more than one-third as much wheat, about one-tenth the number of bushels of oats, and less than one-sixth the number of sacks of potatoes. It takes water to grow crops, and other things being equal—that is, with the same cultivation and the same character of soil—the greater the water-supply, up to the maximum quantity that can be used to advantage, the bigger the yields and the more profit to the farmer." This difference in yields is so great that it is no wonder the editor reaches the conclusion as read.

There is water enough that falls on eastern Kansas and that runs off to the sea each year to irrigate an enormous proportion of the irrigable land, and it may be doubted if any present live to see the demand for it so great as to require its entire utilization. While it is possible and not uncommon to obtain a paying product under dry farming in the region, irrigation will provide for those seasons and parts of seasons when the natural rainfall is insufficient for the greatest and best results; and more than that, it is an insurance against failures in all seasons.

I am now confronted with an opinion on the profits of irrigation with storm waters by a very high authority, viz., Prof. F. H. Newell, of the United States geological survey. In a paper read before the Texas irrigation association recently, Mr. Newell says: "I am still far from confident as to the present practicability in general of this method of development." He also says: "It must not be supposed that irrigation is alone valuable in the arid or semi-arid portions of the state. Perhaps the greatest benefit will come through the construction of irrigation works, not with the intention of using them at all times, but rather as an insurance against the deleterious effects of occasional droughts." In spite of the doubts of Mr. Newell, we have the testimony before cited in this paper of the long-continued use of the system in India, and with remarkably beneficial and profitable results, and that with a class of products that must meet the competition of the world's markets. Even now, Kansas farmers and Southern cotton-planters are engaged in an unequal struggle against this most formidable competition.

India has approximately one-half the area of the United States, exclusive of Alaska, and about four times the population. This indicates a density of population about eight times that of this country, and yet we find that country making rapid strides in its commerce with the world. The topographical and climatic conditions are not widely varying from ours, being located between

the eighth and thirty-sixth degrees of north latitude. It has, as has this country, great range in its rainfall, varying from almost rainless, as in Arizona, to the greatest rainfall known in the entire world, viz., at Khassaya, where the average annual rainfall is given by Haswell as 610 inches. The English government has expended in irrigation works of all classes an amount variously estimated, but well up in the hundreds of millions of dollars, with the result of not only paying dividends on the money invested that are satisfactory, but with great profit and advantage to the people, besides the vastly more important consideration of having put a period to the frequently recurring famines that were formerly so horribly devastating to the country.

Finer fruits, grains, vegetables and animals never grew than have been always grown in Kansas whenever and wherever the rainfall has been abundant and well distributed. To say that finer fruits, grains, vegetables and animals never grew than are always grown in Kansas, that is to say, to place the products of this state at the very top of the ladder, requires but the application of well-proved and demonstrated practices in the older countries of the world. Irrigation knows no method of placing water on land and crops so utterly unscientific and illly adapted to the needs as the rainfall in its natural way. And there is nothing left but to follow the examples of those people in other parts of the world to wrest from nature the boundless prosperity that a beneficent providence has placed within our reach. But above and beyond all considerations of material prosperity, is to be considered the demands of humanity. Human character is molded by its environments, and a thrifless man cannot be of the greatest use to himself or to his country. A high standard of manhood is more to be desired than material prosperity, but the two must go hand in hand.

E. P. Diehl: I am familiar with two dams, or rather land embankments, where leakage is from $2\frac{1}{2}$ to 3 inches. The engineer said his method was to dig the ditch three feet deep and three feet wide, and to have no water pass under the soil.

G. M. Munger: I used this method to abrogate seepage: We dug three trenches and filled up with three stone walls, with dirt between. The settlement was not sufficient to allow the crest of the dam to reach the water level. In my case the treatment of that dam has been very successful. There is seepage, and constant seepage; sometimes more, and sometimes less. The greatest depth was about 17 feet, and the amount of water passing through the drain was about what would fill an inch-and-a-quarter round pipe.

Prof. E. Haworth, of the State University: Do not become too enthusiastic on this subject just now. By this, I mean be careful, or our enthusiasm will run away with our judgment, and the result will not be as good as if we had moved more judiciously. How to get enough moisture in the soil to satisfy the growth of plants, and how to keep that moisture in the soil, is the proposition. We want to regulate the moisture. We suit our clothing and our houses to the variation of the climate, and the light that enters our room, so we can have less or more, as we desire, yet we are unable to perfectly regulate the moisture in the soil. We have practiced drainage longer than irrigation. We learned that a century ago. At the present time of the year, with heavy rains in the Mississippi valley, we drain it off out of the land and into the streams, and usually before the summer is past we are suffering from lack of water. Now I do not see why we cannot make some arrangement for putting water back into the ground as well as taking water out of the ground. We have accomplished one part; only a few are trying to ac-

complish the second part. In most localities the annual rainfall is enough to meet the demands, and I believe it is estimated that 24 inches of water will raise almost any crop; and even in southern Kansas nearly three-fourths of the area has an average annual rainfall of 24 inches. We have in the western part of this state an average rainfall of 15 or more inches. If we can save this and use it on plants in their growth it would about half meet demands. Our problem is not so much how to get water as how to save the rains. There are a good many different ways. First get the water. Kansans talk of the underflow. In Colorado underflow is scarcely spoken of. They dig orchard-canals, and draw water from the mountain streams as it flows through the valley. In one part of the country we expect to get water for irrigation in one way, and in another part another way. Kansas has a wide underflow. It has been sounded from the east to the west side of the state, and a great many people are enthusiastic on the subject of underflow, because only a relatively small part of the state can get its benefits. Much of eastern Kansas can never irrigate largely by getting water out of the hills. We must look to some other source then. The eastern border of the underflow area is an irregular line from north to south, while I find in western Kansas, about one-fourth of this area of the state. In other places we find a narrow strip in the river valley. If you go down 20 to 30 feet there is plenty of water. Every farmer through that area has his well, and we have never heard of a well in the Arkansas river valley failing to produce all the water wanted. But if he will go to the hillside he probably will dig 300 or 400 feet to get water enough for his purpose. If our minds are made up to irrigate our orchards, strawberries and blackberries, where will we get the water? In the southern part of the state the average rainfall is 40 inches; farther west it decreases. So the areas with underflow have an abundance of rainfall; and we should catch that rain and hold it for use—reverse what we did when we drained. I believe this is practical. Look at eastern Kansas: 1,000 feet above sea-level, at one time perfectly plain on the surface, but now full of grooves. These have worn into it one way and another. Ditches are dug here and there, and the Arkansas river flows through one valley; we have another depression, and the Neosho flows through that; and one for the Verdigris river; and each one of these streams has many tributaries, trending almost always at a right angle. These tributaries are simply ditches dug down to the depth of 200 feet; then still lesser tributaries, until the whole surface of the country consists of drains—some not more than a quarter of a mile long, some four or five miles long. Thus the surface is covered. I believe it practical for him who owns a farm in any valley to make use of dams in all ditches, and when spring rains come simply catch the water in these reservoirs. Then when the dry time comes we will let it out on our orchards, and put it on as we need it. Building these reservoirs is a simple matter. A great many try it and fail. They wash away, and when they want water there is none; but with a little perseverance you can build a reservoir which will stand for years. Westward this condition varies somewhat. We must there dig wells and pump the water. Under the Arkansas valley, averaging four miles wide from state line to Arkansas City, we may safely say there is water enough to irrigate every foot of it needing irrigation in the next 100 years. The valley is approximately 250 miles long, averaging 50 miles wide. If strawberries grow at the rate of \$150 an acre, and apples at the rate of \$400 per acre, and we can get enough water to irrigate 10 to 100 acres of apple orchard, it can be made to pay. One small fruit-grower says that in about two years out of three we have

a period of dry weather just at the time when the fruits most need rain. We have a 30-inch rainfall in the year, but through the growing season not as wanted. We want water first, in larger rainfall than we receive. We want mulching, and subsoiling, and then the reservoirs. Begin with a small reservoir to catch the rainfall. Out in the western part of the state we want to dig down and get the water that exists there. It makes no difference where it comes from. The question is whether the water is there, and can we get it? There is one thing to remember: If you have 40 acres of ground, you can have a reservoir and catch the running water, and have a good deal of water to spare. We do not need to irrigate much of eastern Kansas—probably will not need to irrigate in this part of the state. These crops, when they do well, amount to hundreds of dollars per acre—crops on which we can spend \$5, \$10 or \$15 per acre and hardly feel it. And water upon these few acres in this kind of crop will produce a large return. Such irrigation pays. The water is there. Nature has done almost everything for us, and remember we have to do but very little.

A member: Mr. Emery called up a question about an irrigation plant at the old Soldiers' Home, at Fort Dodge. We put in a pump. We bought a 6½ horse-power engine, and then offered to put in a centrifugal pump. I do not think it cost us over \$300 of the \$3,000 appropriated by the legislature last winter. A half-dozen farmers examined the engine, and they put down the pump at a cost of \$85. They can move their engine from one farm to another, and it is a question which will be the most advantageous—a portable engine and centrifugal pump, or to raise water by wind-power. I have plenty of water about 7½ miles from the Arkansas valley. There is an abundance of water within six miles of that river. Just how long wells of that character in that locality will stand I do not know. As to the reservoir, I do not know now how well I will succeed. I did not get it just as I would like it. If I had to do it again, I should hire boys, and put horses in to tramp it down, and then wet the dirt, and tramp it down again. The water is there, but you have got to work for it.

Prof. E. B. Cowgill: I got the irrigation fever a couple of years ago, but I had no orchard to irrigate, and I went out in the Arkansas valley and bought 80 acres of land selected on the underflow, where there was about 11 feet of soil spread over gravel. My land laid on almost an exact level. When I put the instrument on it, I found it fell off, 80 rods from the west to east, about 50 inches, and I had some trouble to determine the highest point, it looked so level. The first thing after securing the land was to develop the water-supply. Where I dug in, the water was 11 feet from the surface. I procured 2x4 scantlings, and made it into curbs 18 feet long. I had a hole dug down to the water, put this curb in on end—the lower end of scantlings were sharp. I then put the sand-pump in it and pumped the sand out, and laid stones on top of the curb and it settled down as long as I took sand from the inside. This curb sank down 18 feet, which was 8 feet under the water. It was 12 inches inside. Then I procured 6-inch pipes, perforated for 8 feet of their length, and had them covered with brass wire-gauze, and dropped inside the curb. The description of one is the description of both. I had two. I then got gravel and filled in along between the pipes and curbing. Raising the curb up we continued to fill in with gravel, so we had the pipes entirely closed around or filled in close with gravel. I put in the pump-cylinder attached to pump. It struck over 12 inches of water, and I went to pumping. The water came very freely. Some pump-men were very anxious to show their ability; I told them

they could use my wells, to see whether they could pump them dry. They attached a nine horse-power gasoline engine to the pump, and pumped several hours at the rate of 300 gallons a minute. Then they increased the speed till they got 500 gallons per minute, and in seven hours they lowered the water around the pump two inches. Professor Haworth claims abundance of water in the underflow of that valley, so I am abundantly satisfied with the water-supply on my land, and have dismissed all uneasiness on this point. Next was how to use it. I bought two windmills, and put one to each well. In order to accumulate this water for use, we laid off a reservoir; plowed and scraped the soil, making an embankment four feet high by scraping the dirt away. After I banked this up four feet high I got the dirt pretty thoroughly wet, and my man and I took the drag and teams and mussed around in that mud for a day or so. That was late in the fall a year ago, and it did not hold well, though it accumulated some water. The contract cost was \$40, and the man who made it told me he averaged for himself and team \$3 a day; so it was not a very expensive matter building a wall around that half acre or more of ground. The water lift was only 14 feet. The reservoir does not hold so well this spring. I said, "Let the water out until you can get in with your team." He had eight horses; one team tramped back of another until it was hard. He worked about a day and a half that way, and reported to me that he could make no impression on the bottom. We put the pump to work. During the 1st day of July there was no wind, and my man reported that the reservoir sank away four inches during the hot weather after July 1. It ought to fall that much at that time of the year; there was no wind, and as much evaporated as during other times. I had a little experience in irrigation this last season, and I found I had not power enough in my two 12-foot mills to irrigate much; I found it took much water. I think the main fact to bear in mind is that a windmill that will pump water for the chickens, cows and stock does not give enough for irrigation purposes. I have disposed of one of these 12-foot windmills, and contracted for a 25-foot mill. The power of this will probably be 1,000 gallons per minute. This is a six-inch well. I do not know the limit of the supply when the well is properly arranged. Now I want to tell you about preparing for my orchard. I plowed to leave dead furrows where the trees are to go. I have had this land subsoiled, also. The main ditch from the reservoir runs along the west line, and the end of the rows that were subsoiled come up to this ditch, and when I get ready with water in abundance, I will in the spring planting-time have the ground thoroughly soaked before planting the trees; after our planting I will make furrows close to the trees, and apply the water as necessary. From studies I have made on the subject, I am satisfied the amount of water people think enough is underestimated. The Utah experiment station finds it takes 50 inches of water for the orchard. Their horticulturist says the roots of apple-trees need fully the depth of moisture used for our corn crops. Professor Hilton has shown by photographs that corn-roots go down four feet. To water, when dry, at any time takes a great deal. The best time to irrigate an orchard is in winter. A little irrigation will surprise one who has never irrigated. I had my first experience last summer. We should be careful not to put the water on so fast as to run it off the land, so it wets little of the surface.

C. H. Longstreth: I doubt very much whether wind is the power. It is said that Kansas is the windiest state, but when we come to use that wind, I find it not there. I could not keep the pump running over one-fourth of the time. I am looking for some other power, which I believe will be gasoline, until we

get electricity. Irrigation is the only successful way to grow your fruit. It assures you crops. Last fall and winter you had plenty of water, and your apples instead of falling from the trees remained on until ripe. Only for the dry spell, the crop would have been satisfactory this season. My apples, this season stayed on the trees, and have been satisfactory. I would not undertake to farm any other way. It is poor satisfaction to get the water from ditches; so people got to using wells and pumps, and in that country it can be done. I think there is not a quarter of the land in western Kansas but can be irrigated from the pump. One man irrigates 10 acres this way, and grows everything he wants. It is said there is only sufficient water to irrigate 7 per cent. of that territory. I think there is more. I have 70 acres set in orchard, and all my expectations in that line have been realized, and I see no reason why fruit-growers there should not be successful. During the past season I irrigated my orchard twice, probably about 25 inches each time. I irrigated thoroughly in February, and again in July. I think it went clear down to the water again. I found the trees rooted down six or seven feet; I do not know how much deeper they go. I found if I did not stir the soil as quick as I could go on it, the water goes right out. It is an important thing to stir the surface and make a fine dust or sand on top, and that will keep the water down. If I had to choose irrigation or cultivation I would take cultivation. There is where many make a mistake. Many think they must irrigate all the time, and as soon as the water dries they pour on more, and many get unsatisfactory results. I do not use one-fourth the water I once did. Keep the ground moist, put water on it; and in order to keep it moist we pulverize the surface. I tried subsoiling, and found it a great advantage. When the ground is subsoiled it holds the moisture a week longer. By careful cultivation of the top dirt—not deeply, but just well stirred on top—you hold the water for the plants to take up, and it does not require as much water for the work. I find twice a year enough. I grow mostly vegetable crops, sweet and Irish potatoes for my own use, and garden vegetables of all kinds do exceedingly well. Cabbage will do well anywhere with water. I think it will not pay to irrigate any kind of grain at present prices. I think subirrigation is a humbug. Most of my land has 10 feet of underflow water. I have no faith in subirrigation. I may be mistaken, but I have no faith in it. It would be a difficult question for me to determine, where there are different kinds of soil all over these farms, as to what distance apart you should put the pipes for subirrigation. If it was successful it would be the finest way in the world. In different fields you would have to put pipes differing distances apart. Tests are expensive. I am going to use water by pumping. I have no satisfaction in water from ditches. Pumping is cheaper, but the power bothers me. I doubt wind-power. If a person wants to utilize that do not use too large windmills. I have one 14- and one 10-foot wheel, and I believe the 10-foot mill gives most water, and is cheaper three to one.

William Cutter: I listened to the talk about subirrigation until I got pretty near mad—until Mr. Longstreth said it was no account. The best apples in the country are on Republican river. We proved that at Chicago. We bought 80 acres on Republican river, land that raised 75 bushels of corn this year without irrigation; and we started an orchard. I do not believe we need go 100 miles south to get our apples. The roots of our trees will reach water, because from the very first spade of earth, the ground is moist there.

W. H. Barnes, Acting Secretary: Some people think Kansas the only place they have to irrigate. Before me is the programme of the annual meeting

of the Michigan State Horticultural Society, which took place last week at Adrian, and irrigation was up before them. I have the programme of the Illinois State Horticultural Society, which met on the 2d and 3d; it has irrigation on it. Kentucky, Minnesota and Nova Scotia are interested in the same subject.

JAPANESE HORTICULTURE.

By Professor Georges, Kansas State Agricultural College.

I was employed by the Japanese government for four years as professor of agriculture at the college, and I had abundant opportunities to observe horticulture. In fact, I made a special study of their economic plans, including horticulture. Japanese plums are prized highly in this country. Introduced by the dozens, they do well all over the United States—certainly so in the Southern and Central states. They are superior to our home plums in quality and size. I think they have at least 50 varieties there. The first comes early in June—a small plum, very meaty, with small stone. About the same time comes another fruit, the Lugford, a little early fruit, found in China also. This fruit, much relished, is about as large as small plums, and excellent, but not very meaty. They have no commercial value in this country. Later plums continue to come in. Some are very large. The Japanese do not appreciate ripe fruit. They pull it before it is ripe. They pickle them, and eat them the first thing in the morning to clear the stomach. They are exceedingly sour, and not agreeable. There are upward of 40 varieties of persimmons. They are as common as our apples here. Some have been introduced here, and do well in the Southern and Middle states. Some are very large—larger than my fist. The majority are small. Some look juicy when ripe, others firm. The majority have no astringency. Their grapes are excellent. I do not know whether they have been tried here or not. There are white, brown and black grapes. This nearly completes the list. They have no apples nor cherries. They cultivate cherry-trees for the bloom, which is large, double, and fragrant. They grow them for ornament. They do not seem to know that there are cherry-trees that bear fruit of value. I shall be glad to answer any questions, if you have any to ask. It was distressing to me to see the Japanese on the streets eating green persimmons. Imagine my surprise to find they were not astringent. They use irrigation for rice cultivation. The rainfall is heavy, and they need irrigation only for rice. Japan is comparatively a small country, about the size of California, and contains 40 million people, who mainly get their sustenance from an area of 20,000 square miles. The interior of this country is thinly settled, few people living there. The population being crowded together in a small area, their system of cultivation must be the most intense. An average-size farm is less than two acres. They have few domestic animals on such a small farm. They have horses for driving, and I have seen a few used in stirring up rice-fields, but hand-labor prevails. Cattle are used chiefly as beasts of burden. A few cows are used for milk and butter. In the interior of the country they use American condensed milk. Our horticulture has derived vast numbers of ornamental plants from Japan. One of the most beautiful sights was a hillside covered with large tracts of lilies, in full bloom. I have seen on one side the deep blue mountain lake, and the north side-slope covered with these large lilies in bloom. They grow a few peaches, also pears and almonds. The best that can be said of their pears is they are juicy, a sort of sweet water with no distinct flavor. I will also men-

tion the quince; it belongs to the species of Rios Chues. Our quince is a small, stunted tree or bush. Theirs is a magnificent tree, larger than most apple-trees, and the fruit larger than my two fists. It is not as good a quality, but can be used as we use the quince. They are strong in flavor. They raise a few Irish potatoes, and sweet potatoes abundantly. Some strawberries are raised for the large cities. They have many vegetables unknown to us here. They grow some of our ornamental plants as vegetables. Caladiums they call sugar potatoes, and dig them just as we dig potatoes. They are eatable, but not as good as potatoes. In the spring they use, as we use the asparagus, a plant of aralea cordata. It is a weed on the mountain. They sow the seed in the garden, to care for itself until three or four years old, and then take them up and fill in manure in the pit prepared, and arrange them on top of this manure and fill in the earth to this. They leave them a year, then dig up and cut these shoots. It answers for asparagus.

THE CAMPUS.

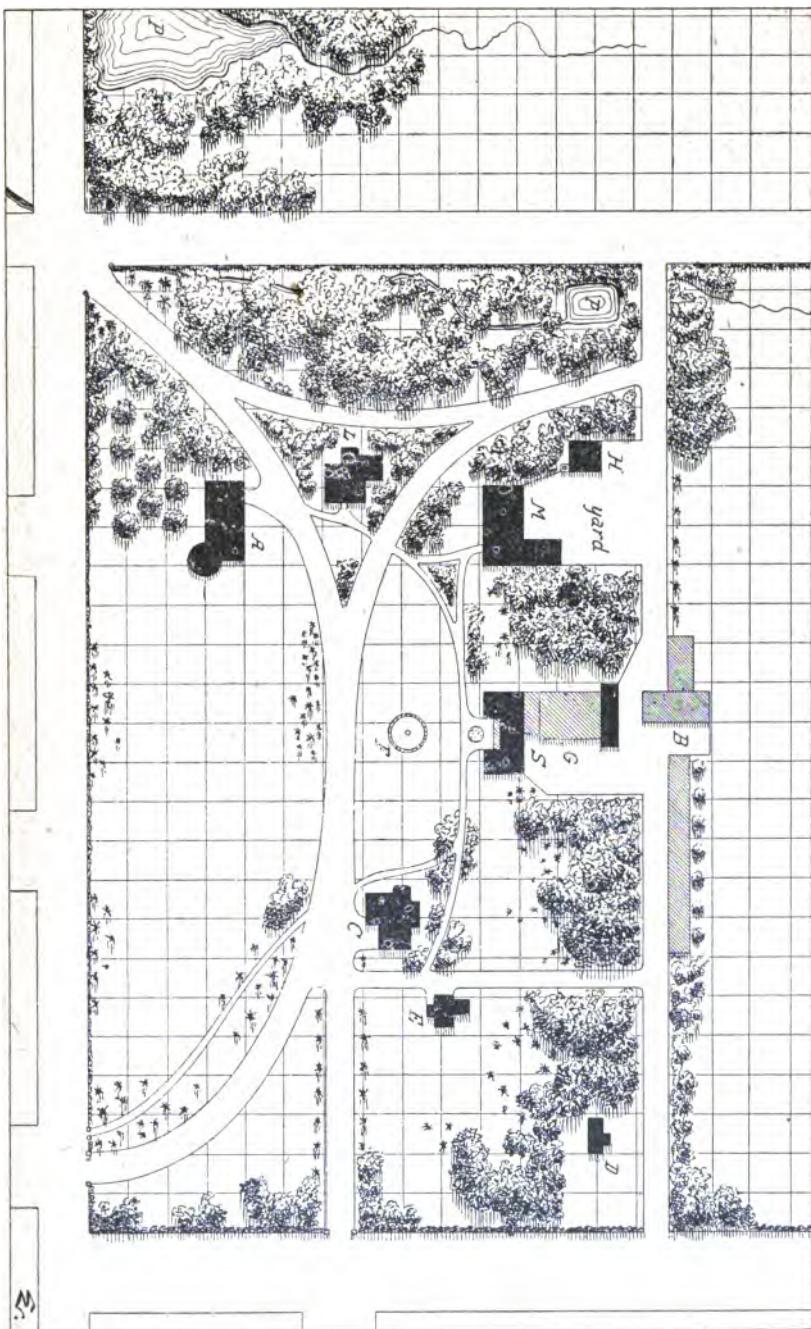
By Prof. J. D. Walters, Kansas State Agricultural College, Manhattan.

Having spoken before this Society, at former meetings, of the "Improvement of Home Grounds," the "Remodeling of Old Homesteads," the "History of Landscape-Gardening," and other kindred topics, I shall now take up the improvement of school-grounds and the landscape setting of public buildings. There is a vast amount of missionary work to be done in this direction in our state. While the Society in its meetings from year to year discusses how to raise the red apple, the yellow pumpkin and the swelling cabbage, it should not neglect to cast a glance at the 5,000 school-grounds, most of them as barren and dusty and shadeless as the "Valley of Death." I venture to assert that of the country school-grounds of Kansas fully 30 per cent. have no trees at all, that less than 500 school-grounds can show any systematic attempt at planting and ornamentation, and that over half of the city school-grounds can exhibit little more than a few neglected, scraggly trees, planted in rows around the square. This is not as it ought to be. The esthetic training of the rising generation should not be neglected. The influence of the beautiful upon the growing mind is recognized to be among the first forces in education—a force that can hardly be overestimated; and it should not be forgotten that lawns, shrubs and trees have a powerful hygienic influence as well. To my mind no sight can be more desolate than that of a lonely, white-painted schoolhouse upon the sun-burned or black-burned prairie, with scarcely a fence around it and not a tree or shrub in sight. How can such an utterly-neglected shanty become an agora of learning, of science, of character, of morality?

In many cities spasmodic attempts are being made from time to time to improve the character of the environments. A few trees are planted, and then left to shift for themselves as best they can. Borers, maple-worms, box-elder bugs, storms, droughts and hungry horses at once begin their war of extermination, and within a year or two the result may be expressed by an equation. I know of a three-acre school-lot surrounding a high-steepled stone school

PLAN FOR IMPROVEMENT OF GROUNDS OF THE THE OKLAHOMA AGRICULTURAL AND MECHANICAL COLLEGE. (See opposite page.)

P—Pond.	B—Horticultural Barn and Open Sheds for Student Vehicles.
H—Steam Plant.	G—Greenhouse.
M—Mechanics' Hall.	S—Science Hall.
L—Laboratory.	F—Fountain.
A—Armory.	D—Dwelling of Director.
	E—Experiment Station.
	C—College Hall.
	The small squares measure 50x50 feet.



building in a town of 4,000 inhabitants—a lot that has not a single shade-tree or bush upon it. The only sylvan ornaments are two or three scraggy little Scotch pines, about fence high, and planted just where they should not be. Yet the schoolhouse was built 10 years ago, and stands on the main street, near the center of a city that loves to call itself the "Queen of Kansas." The soil of the yard is all that could be wished for, and the charter of the water-works contains the clause that the educational institutions within the city limits are to receive all needed water free of charge. The cited case is not an exception, it is the rule all over the state. The state institutions score a little better. Attempts have been made at all of them to fence the grounds and to plant trees, yet even here but little effort has been made, as a rule, to work in accordance with some carefully-prepared plan. The handsome grounds of the Agricultural College stand in strong contrast with those of some other state institutions, from which the stone-chips of the builder were never fully removed, or which were laid out so narrow and cramped as to indicate a state measuring 20 by 40 instead of 200 by 400 miles, and reaching to the stars.

However, it is easy to criticize. The question is, What can be done? And it is here that our Society should lend a helping hand: (1) By teaching the principles of the art of landscape-gardening, i. e., the planning and laying out of landscapes; (2) by giving practical instruction as to the proper varieties of trees, shrubs and lawn-grasses to be planted, the best methods of their propagation and care, the correct methods of building roads, walks, etc. The first part of our problem deals with fine art, for the principles of landscape-gardening are the same as those of all other art, from architecture and sculpture to painting and decorating. To state these principles is difficult, because they cannot be covered by mathematical formulas. All fine art is a conception of the mind. It exists at first in the form of an ideal, and ideals may vary infinitely. Every work of art consists chiefly of composition, and the artist is in the main a composer. To compose a beautiful whole with a number of related parts is its purpose. The details, then, may be furnished or worked out by mere skill, and skill is not necessarily art. To illustrate: A polished column, a well-cut corner-quoins or keystone, a finely carved finial or rosette, are not architecture. Architecture is composition. An architect is one who composes, who adds together to a harmonious whole materials of many kinds, that the product may express the character of his ideal of a building. His art-work is done as soon as he has expressed his ideas on paper, i. e., as soon as he has made the drawings and specifications. The work of constructing the building belongs to the artizan, the stone-cutter, the mason, the carpenter, the tinsmith, the plumber, etc., and these are not artists. The architect may act as superintendent of construction, but even here he is an artist only as far as he continues to compose.

Applying these general facts to our subject, we may say then that landscape art is the art of composing ideal landscapes. In doing this the landscape-gardener, like the architect, must depend upon artizans for the actual shaping of the ground; upon the engineer for the construction of the drives and drains, upon the nurseryman for the growing of the trees and bushes, upon the mason for the building of the enclosures, upon the florist for the care of the flowers, etc. These men are not artists, because they do not compose, but work out details.

I have thus tried to clearly draw a line between art and skill, which should never be obscured, because the term landscape-gardening leads many into

believing that the art is a sort of trade, like the raising of chrysanthemums or the grafting of young trees. The effects of such a misconception are obvious. They are the same as would result from intrusting the planning of a house to a mere carpenter. The landscapist, like the architect, may be unable or unwilling to leave the actual creation of his art landscape to another for superintendence. He may assume the continued care of the product of his mind, all the more because a landscape cannot be finished at once, like a picture or a statue, but has to grow up gradually and slowly; in fact, it never ceases to change its character, and requires constant attention. Yet as the superintendent of a park he is an artist only in the degree in which he composes.

Now, what are the chief qualities of an artistic composition? Ruskin defines a good composition as one in which every detail helps the general effect. A. J. Downing, the veteran teacher of landscape-gardening in America, defines it as "an art which selects from natural materials that abound in any country its best sylvan features, and by giving them a better opportunity than they could otherwise obtain, brings about a higher beauty of development and a more perfect expression than Nature herself offers." These definitions are very similar. If Downing differs from Ruskin, it is simply because the former defines landscape-gardening in special, while the latter speaks of art in general. There are of course many differences between the fine arts, which modify the laws of composition somewhat. A painting is to be looked at, while a landscape is to be walked over. The student of painting acquires both theory and practice of his art simply by his own experiment, i. e., by actual doing, while in landscape-gardening the art must be acquired by studying Nature and the works and writings of acknowledged artists. Nor can the teacher ascertain the growth of his pupil by elaborate tests, which is undoubtedly a reason why the art has not as yet found its way into the curriculum of many universities and academies.

Having learned that art consists simply in composition, we will now consider the elements of beauty in landscape art. The main element is evidently naturalness. A park, a front yard, a campus, must look as if "it grew that way." Other things being equal, that landscape is the most perfect in which the work of the designer has been most successfully concealed. This seems to be a very simple idea, yet it took centuries for gardeners to discover it. They constructed hanging-gardens, roof-gardens, dwarf-gardens, grotto-gardens, etc., long before they discovered that the eye loves Nature's art best. It was only now and then, here and there, that a great mind dared to offer such an agnostic thought. Tasso, in "Jerusalem Delivered," gave the following beautiful description of an ideal art landscape: "Everything that could be desired in gardens was presented to their eyes in one landscape, and yet without contradiction or confusion—flowers, fruits, water, sunny hills, descending woods, retreats into grottoes—and what put the last loveliness upon the scene was the art which did it was nowhere discernable. You might have supposed—so exquisitely was the wild and cultivated united—that all had somehow happened, not been contrived. It seemed to be the art of Nature herself, as though in a fit of playfulness she had imitated her imitator."

The element of naturalness may be gained or increased by many means; first by open lawns. The lawn is the foundation of every landscape. It should be laid out in long vistas, if possible, and there should be places where the whole extent of depth can be seen. Such a treatment gives repose to the whole, and is especially necessary here in the West, where we are used to

long stretches of unbroken prairie. Our eyes are not used to close restraint, and we feel that we are not outdoors any longer as soon as we find our view shut off at close range. Naturalness is also gained by the employment of curves, or we may say that it is lost by the presence of straight lines. Nature abhors a straight line. It is found in Nature only in the crystal. The hills are curved; the streams are curved; the trees are curved; the grass-leaves are curved; stems and branches are curved. The moment our eye rests on a straight line, we are conscious of something artificial. We feel at once that Nature has been tampered with. When it becomes necessary, then, to add or build artificial features, such as drives, walks, water-courses, ponds, bridges, curved lines ought to be adopted in preference to straight ones. This does not mean of course that one curve is as good as another. A walk or drive connects two objective given points, and it should connect these in a long-stretched and genteel curve as directly as possible. There should also be added a real or pretended reason for the curvature—a tree or a bush, a depression or an elevation, or perhaps a rock placed on the concave side. Naturalness is also gained by grouping the trees and bushes—in Nature they are usually found so. An oak grows up in the field, it drops acorns all around it, and a younger generation springs up; so we find oaks growing in groups, walnut trees growing in groups, willows growing in groups, and elms growing in groups. A row of trees presents a straight line, and strikes the observer at once with the same feeling of artificiality which any other straight line suggests. Grouping gives the planter a chance to exhibit to advantage the individual specimens on the lawn. Two or three large trees may form the center of a group. Around these may be planted a few a little lower; and still outside of these may be placed some shrubs which grow lower still, and serve to hide the rough trunks, and at the same time they are themselves better exhibited on account of the natural background. Naturalness is also gained by the use of hardy shrubs and herbaceous plants. Kansas grows to perfection a large variety of these. There are the lilacs, the Spireas, the Deutzias, the Forsythias, the Weigelas, the roses and many others. A dozen of these may be planted where only one tree would grow. In fact, we Kansans, when we plant grounds, usually plant too many trees altogether. It has been said that the Kansas heaven has more trees in it than any other. Naturalness is also gained by planting the large-leaved and evergreen specimens in low places and the angular-branched colored specimens in higher and drier places. The willow and sycamore grow on the banks of the creek or pond, the walnut and the maple on the bottom land, the oak and the ash on the slope, the black-jack and the cedar on the hilltops. In planting thus we imitate Nature. We should also consider that naturalness is lost by the negation of the enumerated points. It is lost by artificial constructions of all sorts—be the disturbing element a badly-pruned tree or a grotesquely-shaped evergreen, a rockery piled up or a large trellis whitewashed, a miniature pond or a board fence. To be sure, fences are often necessary, but they are frequently unnecessarily obtrusive and ugly. If there must be a fence, and I concede that a schoolhouse yard should be fenced, let it be a hedge of privet. The privet hedge is a thing of beauty, and deserves to become a common sight in Kansas. I have sung its praises before, and shall sing its praises again as often as I may have a chance—plant privet. Naturalness is also lost by painting buildings and fences an obtrusive white or a solemn drab. Extreme colors always rob a landscape of repose and dignity, though single small bright objects, like

garden-seats, garden-bowers, boats, etc., are not as disturbing as long fences and large buildings. As a second element of beauty in landscape-gardening may be named unity, by which is meant the harmony of all sorts and their subserviency to a central artistic idea—sometimes connected with a practical purpose.

Architects are very careful to indicate in the character of the exteriors of their structures the general purpose to which the buildings will be devoted. A railroad-station, a cyclorama, a court-house, a schoolhouse, a store, a bank, a dwelling—every building demands of the designer that its character be expressed in its exterior. This should be true also of a landscape. The "campus" should show that it is the frame of an educational institution. It should indicate this in its broad and central gateway, in its extended lawn in front of the buildings, in its broad walks leading in gentle curves to the different entrances, in the semicircular grouping of the main buildings, in the heavy fringe or belt of timber and bushes forming a common background to the whole view, and in the absence of all artificial construction sometimes found upon home ground such as garden-houses, bowers, rockeries, rustic seats, etc. Since the "campus" is usually deserted during the summer, but thronged by students or pupils in winter, its sylvan ornaments should consist to a good degree in evergreens. It is an easy matter to form characteristic groups of evergreens, even in Kansas. They may be formed of the red cedar and the dwarf cedar, of the tall and dark-green Austrian pine and the scraggly Cape of Good Hope pine, of the yellow-leaved Scotch and the bushy Norwegian pine, of the northern spruces and silver-leaved Colorados. All of these varieties grow well in our state. Character will also be gained by planting the handsome ampelopsis against the stone walls of the buildings and enclosures, and the honeysuckle or trumpet-vine against the columns of the portico. No landscape is complete without the element of water, and the manner of introducing this life-adding factor may have a great influence upon the character of the campus. Water can be added in three very different ways: (1) By means of large ponds, or better still in the form of irregular lagoons; (2) by springs and rivulets connected with rockwork; (3) by means of architectural fountains and basins. The first method, requiring low grounds, produces not only naturalness but also the effect of increased distance. Many of you attended the World's Columbian Exhibition, and remember how the water, carried everywhere by the branching arms of the lagoons, produced a very characteristic effect in the middle foreground of every position an observer might take. These bits of water appeared natural everywhere; and the fact that one could hardly see two buildings at once without looking across a stretch of water, made a park out of a place which would under any other treatment have been a crowded city square. The lagoon also permits the successful planting of very effective swamp-grasses, water-lilies, willows, water-elms and bushes of many kinds. The second method requires careful treatment with regard to natural topography, and should be accompanied by a liberal addition of dense pine thickets. The third is admissible only in the front, or vicinity of buildings or broad flights of free steps, where it may be considered a part of the architectural frame. To plant a cast-iron fountain in the center of a natural landscape is bad taste, as bad as the indescribable distribution of cast-iron statuary.

The campus might, of course, intimate its character as the home of the natural sciences—of geology, botany, mineralogy, etc.—by exhibiting strange

species of trees and shrubs, or perhaps large specimens of interesting rocks and petrefactions. I have seen college grounds in many parts of Europe showing such efforts; yet it is very easy to rob the landscape of its dignity and repose by such means. A botanical garden or an experimental nursery cannot be a park, and a park cannot at the same time be a botanical garden. To try to combine the two would produce a ridiculous hybrid—a dime museum. For an illustration of the stated principles and elements of landscape-gardening I will refer you briefly to the cut of the campus of the Agricultural and Mechanical College of Oklahoma, which was laid out about three years ago by the writer of this paper. The grounds cover about 20 acres adjoining the city of Stillwater. The land was a piece of level prairie at the time the survey was made. The only depression is on the west side, where a small "draw" offered an opportunity for some ponds, and a display of trees and bushes in dense planting. The principal roads and paths are curves; the buildings are arranged in a semicircle in the rear of the main building, of which only one wing is shown. The foreground is open lawn—the rear a dense belt of timber. The armory, being the most characteristic building, has been pushed forward and placed in the vista of one of the streets of the city.

The illustration, prepared by Prof. Arnold Enoch, of the State University, is drawn to a sufficiently large scale to explain all the main features. But I hear someone interpose, "This will do for a large lot of 20, 50 or 100 acres; the question with us is, What can be done upon the usual school lot of two or three acres?" I confess that it is hard to give a satisfactory answer. The pupils need a large playground, or rather two playgrounds—one for the girls and one for the boys. The games which children ought to play require all the space, or more space than can be provided for them. Flower-beds, shrubs and lawns are almost an impossibility under such conditions. Yet even here the artistic mind will suggest some remedies. Where there's a will there's a way! A dense thicket of trees might be planted in the rear half of the lot, and the front half might be left open. The whole might then be surrounded by a privet hedge. Elms might be planted outside the lot along the public road. An Austrian pine might be added on each side of the gate, on the inside. Honeysuckles and trumpet-vines might be trained over the out-houses, and ampelopsis on the school-building proper. A pair of broad, tall, roughly-cut stone posts might be made to serve as gate-posts. The buildings might be painted in light stone or drab colors, and stone or brick walks, gracefully curved, might be substituted for the usual straight lumber walks. More than this, the grounds might be cleaned up and kept clean—something that is not always properly attended to. In all cases, however, be the landscape-work intended for a park, a campus, or a school-lot, a careful drawing ought to be made first. The thinking should be done over the drawing-board, with the pencil in one hand and the scale in the other. Not a tree should be planted nor a walk laid out without previous careful planning. That all larger grounds require the professional work of a trained landscape architect is self-evident. As for the best varieties of lawn-trees, belt-trees, bushes, evergreens and grasses, none should be planted that are not perfectly hardy. There are no handsomer trees in the world than our native elms, sycamores, oaks, maples, ashes, coffee-bean, willows and cottonwoods. These have successfully resisted the blizzards of the Kansas winters and the hot blasts of the Kansas summers long before landscape-gardening became a problem west of the Mississippi. They become things of beauty and joy whenever and

wherever we invite their hospitality to our sunny lawns. For information concerning hardy trees, shrubs, vines and evergreens, consult the bulletins of the Kansas experiment station at Manhattan.

PROGNOSIS IN HORTICULTURE.

By Hon. Edwin Taylor, Edwardsville, Kas.

When you send for the doctor, in his professional capacity, he first makes a guess at what ails you; this he calls diagnosis. Then summing up your age, apparent strength, previous condition, nature of the supposed disease, anticipated effects of the medicines prescribed, he figures out by a process of addition, division and silence whether you are going to get well or not. This he calls prognosis.

Prognosis might be termed future-tense wisdom. It has its legitimate uses, but like an unloaded gun is dangerous in inexperienced hands. It is particularly affected by novices, amateurs, dilettanti and pretenders in all those departments of human knowledge which are not exact, and in all those avenues of human effort wherein variable nature is constantly changing the conditions and injecting new factors into the equation. In like manner, as the oldest practitioner never encountered two cases of sickness that were exactly alike, so the oldest gardener never planted two crops under exactly the same conditions. The variations of the soil as to content of moisture, its composition, mechanical division, previous cultivation, vitality of seed, atmospheric condition, all present an infinite variety and make-up for each particular instance—a composite situation absolutely new and original. But the experienced cultivator confronts whatever newness is presented in his daily task without dismay, for he rests securely upon the uniformity with which each factor in the problem will answer for itself when eliminated from disturbing causes. The trouble begins when either the absentee advisor or the thoughtless operator ignore or are ignorant of a greater or less proportion of the conditions involved.

The controlling conditions in horticulture, contrary to the rule in mechanical callings, are not general but local; so that whoever enters upon the career of a cultivator of the soil, and then rests his case upon those formula of general application which he may find in the books, is certain to meet disaster. For instance, in the production of the important tuber known to the scientific world as *tuberosum Irish-manum*, when planting-time comes, the critical questions are not botanical, chemical, geological, or biological; they refer to that particular crop and no other. They are such as these: Is this identical seed in perfect vitality? Is this soil mellow and fine? Is the man marking out there making his rows perfectly straight and of the right depth? and is that boy putting in the sets right? After the emergency is over, then it is well enough to consider the chemistry involved, the province of the cambium layer and how in the mischief it is that clover can take up nitrogen from the air and potaoes cannot. It is not ignorance of natural law that hurts in our business, it is inattention to details.

Horticulture does indeed present its scientific features which have great value for its original investigators searching for its north pole; but to the gardener, who makes gardening a business, the process and art of horticulture are its principal features. If I may be allowed to call the people who write the books and articles on horticultural subjects horticultural doctors, then I desire to divide them into two great classes—those who write from retrospect, and those who write from prospect; those who treat the matter objectively,

and those who treat it subjectively; those who base their conclusions upon experimental data, and those who reach their conclusions by mental demonstrations. With the first of these classes I have no controversy; the latter I hold responsible for thousands of failures and millions of loss to horticulture and its allied departments of production. The bucolic mind, whether on garden or farm, is sensitive to what it takes to be the voice of authority. The bucolic eye-teeth are in a state of chronic "uncutness." The country has ever been the favorite hunting-ground for frauds and fakes, humbugs, peripatetic merchants and horticultural doctors of the last class. I here publicly confess to having myself been taken in and done for on a patent right, on a life-insurance policy, on scions of the "verdant fruit," and of having been times innumerable led into error through following the directions of some horticultural doctor whose pomposity and vehemence I had taken for wisdom. In view of the fact that the granger's trustful nature is a part of him and cannot be changed, my question whether there can't be some plan devised for having people who "drop into" the future tense in our agricultural and horticultural prints—in the light manner that Silas Wegg dropped into poetry—held responsible for what they say. A medical doctor has to observe some discretion when he starts in at prescribing, under penalty of the law in such case made and provided; why should a horticultural doctor be absolved from responsibility?

In a leading agricultural paper recently, as an example, was an article on sweet potatoes which contained three wrong directions for their culture, either one of which if followed would lead to disaster. The article was well written; there was no way for the novice to find out where the ice was thin, but to break through it. It was the more dangerous because its errors were well fortified by alleged general principles. Both the dolt and the doctrinaire with us come out strong for general principles. They are unhappy in the presence of phenomena that are unexplained. Conversely, if you will give them a good mouth-filling reason, they will either find or invent a phenomenon to match it. The first-named kills his hogs only when the sign is right, lest the meat shrink away in the barrel, even if Mr. Armour does ignore the zodiac; and the latter, led by the great Horace Greeley, so persuasive in what he didn't know about farming, once lured us into heavy losses through plowing too deep. In a recent number of a prominent ladies' magazine a distinguished scientist pronounces anathema on potatoes as being unsuitable for human food and certain to produce inferior people where persisted in. You all remember a few years ago what a boom there was for fish-eating as basis for brain-development; for real quick action on the gray matter it was said nothing would serve but fish. All of which illustrates the text which reads that "the foolish things of this world shall confound the wise," and if the doctor aforesaid would compare the mental and physical strength of the potato-eating nations, like the Irish and Germans, with the islanders who live on fish he would find occasion for effort to get his laboratory in line with human experience. In this instance the professor has probably done no harm to the potato business, because potatoes are too well established to be talked down; but a few years ago, when he beguiled so many of us into excessive deep planting, at one time, and at another had us planting potatoes whole, and then set us to cutting the seed "east by south" to no purpose, and finally set us all agog over the "mare's nest" that immature tubers were unfit for seed—in those instances he was the same philosopher, and somewhat of a jest. Those of us who can look back upon a long succession of publications in our interest, are

often reminded that the notable departures in our calling have in no instance been on the lines laid down in advance by the horticultural doctors of either kind. In orcharding we have had tons of advice upon systems of pruning, and we don't prune at all; other tons upon the number of varieties that should be set upon an acre, and our problem is how many acres to set to one variety. The questions of fertilization and pollination are almost forgotten in the discussion of freight-rates and cold storage.

The following clipping I cut from a recent paper because I thought it sounded an important note: "The cause of irrigation, which now has such a good start in Kansas, would be advanced if men who know nothing of the subject would quit writing about it. Irrigation is learned by practical experience, not by spinning theories, and if men use it for the purpose of advertising their own supposed usefulness they will soon kill it." Irrigation addresses itself to horticulturists with peculiar force. With corn at 15 cents per bushel and wheat at 35 or 40 cents, agriculture must touch irrigation lightly or lose money in the operation. But with fruit and vegetables for home consumption, and under favorable circumstances for market, we can afford the necessary expenses incident to putting in and keeping up irrigation plants. It is plain that Kansas is going to invest millions of dollars in irrigation in the near future. Much of that money will be lost through haste, waste, unsuitability of means to ends, and exhaustion of resources before returns come in. For the corporate and the rich individual irrigators I have no concern; but I would like to say, to those who don't have money to burn, go slow. Start small, and don't launch out faster than you can make that beginning pay. Don't go in debt. Don't vote a dollar in bonds. Don't be led astray by the ignes fatui exhaled by imaginative and emotional doctrinaires or by the delusive representations of manufacturers' agents, looking for a chance to unload. Let there be no such disaster wrought in the name of irrigation as in the name of the climatic changes promised us 20 years ago. The doctors then were full of predictions and promises of the good time coming when Nature would reverse herself, should we plant trees on the western plains, cultivate the prairies, and disturb the electrical equilibrium by putting down railroads 50 miles apart. A noted authority sent us word from Pennsylvania that the "plow was the true rain-persuader." It was too absurd a project to speak of with patience, but the people rose to the bait. They planted trees—beautiful savannahs, cleared up ready for the hand of man and seeded down to grass for him as permanent pasture, with infinite labor and expense they broke out and destroyed the rich gift Nature had prepared for them in advance. The railroads were laid and the electrical equilibrium didn't even thrive, it just got drier every year until last summer. Nature apparently did not "feel the plasters draw," for scarcely a cloud passed over her face. But in the meantime think of the many thousands of people led astray by the false hopes raised, victims of the learned and amiable—and of those having neither learning nor amiability—who joined the hurrah to boom their town sites and railroad lands; victims who were beguiled onto those arid plains by the mirage of increasing rainfall and productiveness, raised by a false prognosis, there to fritter away the savings of previous industry in a tragic struggle with sun and wind; in many cases to pay for their temerity and credulity with their lives. The pity of it, Iago, the pity of it!

Twenty-five years ago the finest turnouts on the streets were driven by lightning-rod men. Their splendor was only eclipsed by their number. Now they are as extinct as the dodo. Gone are the glitter of the shining wheels

and the seductive tones of the agent's voice, as he tearfully pictured the awful fate impending your wife and child and home, where the unbelieving husband refused to avail himself of the heaven-sent discovery of science for the protection of firesides. Why has the peddler of the latest-improved, platinum-pointed, jointless, corrugated, non-corrosive, lightning-rod been gathered to his fathers—or his wife's fathers? Because the people found out that his specialty was a fake; it was a protection that did not protect. How many millions of dollars were wasted in alleged but useless mitigations of electrical energy there is no telling. The staggering part of it all is the hold it had on the community, and the support it had from high authorities. The "Lo heres" and "Lo theres" of prediction, will continue to bob up in the pathway of the unwary horticulturist. It is not my province to urge their indiscriminate rejection—merely to caution the credulous cultivator not to give way to his predilections for rainbow-catching; not to be abashed either by great names or great assurance; but to take all forecasts of new things, new theories, new methods, new plants, new varieties and new doctrines with an abundance of salt.

SUBSOILING.

A member: I would like to ask the question whether the gentleman here, or anyone in the audience, has seen the results of subsoiling in the way of resisting drought in orcharding?

A member: Last spring I run a subsoil plow four times between some pear-trees in rows, on a plot of ground which was taken for experiment. Our subsoil had not been wet any for three years. This last summer the moisture wet down about 12 inches, and I can see but little difference between the trees where I run the subsoil and the others. Three years ago I found where I had subsoiled the ground held the moisture there while it became perfectly dry elsewhere. In fact it did not seem to ever get thoroughly dry since, and the trees did better. My experience is, subsoiling is the thing to do, because in severe drought the trees show the effects of it, and have ever since.

C. M. Irwin: Last April I put in an irrigation plant, and before we got the ground in shape the water escaped over the ditch. It escaped at many of the ditches in the furrows on one acre of land in corn. The hot winds that came in July did not hurt that corn. This had no water other than what escaped at the time. The hot winds burned the corn all around except where it had been flooded. I told my men we would flood. The corn was perfectly green up to where the flooding stopped. That flooding was done in April. It satisfied me that with an abundance of water before planting corn, the crop will be sure, and I believe it will do away with the burning of the corn by hot winds.

Edwin Taylor, Secretary: I have never had any experience with subsoiling; but when I was young the talk was about deep plowing. It was brought out in the New York Tribune and Herald. Generally every week there was an article on the importance of plowing deep. I was young and enthusiastic, and perhaps too credulous, and what they said was not only law but gospel to me. So I persuaded father, who was not so enthusiastic as I was—being considerable older and not so credulous—to let me plow as Mr. Greeley said in the Tribune. I got four horses and turned it up about 11 inches deep, and up to the time I left Michigan, that field had not recovered from that deep plowing.

G. Y. Johnson: I had and saw excellent crops this fall from deep plowing. I never tried the thorough deep plowing that Mr. Taylor spoke about but one year (1868) on a field of corn. I plowed from 9 to 13 inches deep with an ordi-

nary plow, with one pair of large horses, about five miles from where we are now. Sometimes it would not run as deep as at other times because we struck harder earth. I then planted. I think it rained heavily about July 26, 1867, and not again until nearly one year afterward, yet I never saw ground plow nicer than it did. I got 30 bushels to the acre, and that was my experience with deep plowing in this state. As to subsoiling, Mr. Taylor is right in one regard; you have got to study your soil. Some break the crust and leave it there, but a great many bring it up to the surface to let in the sunlight. That is my theory. W. E. Barnes, at Vinland, is one who will plow his ground only three or four inches deep. Last year we had a heavy rain about the time the generality of corn was earing. Although the corn was made, my man went through one field after that rain breaking that crust, and we got nearly 10 bushels more to the acre off that. So this moisture was not drawn up; it stayed there; and the hard-surface fields did not do so well.

F. Holsinger: I have had experience in deep plowing and subsoiling. There is a difference, but they are closely allied. We must experiment. If you study the reports as they come, they will show you in every experiment that has been made shallow cultivation has produced from 10 to 15 bushels more corn than by subsoiling or deep cultivation. Our soil should have thorough cultivation. Ground will become hard and plants will not grow. I take my harrow immediately after a rain and break the soil, I call it first cultivation; "scarifying" the soil, gentlemen. And I tested a corn-field my tenant had laid by. I had him go over it after it was in tassel and he told me that when he gathered that corn it made 20 to 25 bushels more than that not treated so. On examining the ground in this field it was found to be soft, and in the other as hard as a brick.

Prof. S. C. Mason: We have been making experiments in subsoiling at the college farm. A portion of the land there is underlaid with a clay subsoil. When the season is dry it is almost impossible to dig a post-hole in it, and it is very stiff to work. I am satisfied that loosening the earth with subsoil plow has been very beneficial. My father-in-law, in Clay county, put the subsoil plow into his land in the fall, and run it down as deep as it would go. His corn certainly showed great improvement over the same soil not subsoiled. On the college farm we have subsoiled the vineyard and orchard with good results. The ground at foot of College hill, which is in vegetables, was divided into four plots, and two were subsoiled and the others were not; one received irrigation and the others were left dry. This subsoiling was done in the spring rather late. It was found not as good to subsoil for potatoes and corn, as if dry it began to dry out quicker. I think the reason was that no soaking rains followed. It was in a dry condition, without rains, and it was less able to stand drought than if touched. The indiscriminate use of the subsoiler is not to be recommended by any means, yet it is an advantage to get it well loosened up.

G. Y. Johnson: In February I sowed oats. The idea of deep plowing was in my mind. I sowed them upon the surface, and plowed the ground from seven to nine inches deep. The neighbors said "your seed will rot." They were five weeks ripening. They made 60 bushels, while others raised 15 and 25 bushels. When I got my oats plowed in, I went to work on my corn ground, and it was very high the 1st of June, and had been plowed five times.

G. M. Munger: I irrigated last year in a field that had not been subsoiled, but it had been plowed 9 or 10 inches. I had tried to plow it deeper with a five-horse plow, and when I poured the water on I expected to saturate it.

Instead the water went away, and kept going and going. I can hardly describe it. It was like pumping water into a sponge. Water from a four-inch orifice was let into a furrow 1,000 feet long, and it took 48 hours to reach the other end. I was 36 days watering one field of 30 acres. And this is the land that friend Hilton says needs subsoiling. From the 1st of July to the middle of October I pumped water enough to bury that field 44 inches deep.

Mr. Lovejoy: I was brought up on a farm, and commenced plowing when I could hardly reach the plow-handles. I have worked all my life, and I worked at subsoiling when a boy. I recollect attending an agricultural meeting at Hartford, N. H., when I was a boy, and hearing men talk on the subject of subsoiling, and it impressed my mind. I went home and told my father I wanted to plow to suit myself.' He said all right. I plowed several acres just as deep as I could with father's plow. It was planted to corn and oats, and was a failure, and they charged my deep plowing as the cause of it, which I suppose was true. Plow deep, when it has not been plowed deep, and you will get no crop the first year. Why? Because the soil needs the influence of sun and air. It was two or three years before the land derived any benefit from that deep plowing. Before I got through cropping it it beat any land in that section. In 1857 I lived on the Missouri river, near Atchison, and built a house and dug out the soil on the bluff, and it looked to me of no value. I went to work and planted corn on it very early in the spring, and it came up and grew wonderfully and yielded well. I replanted the land to corn, and raised a second crop the same year on that soil, on the bluff of the Missouri river. There is virtue and power in land if you can dig it up and let the sun work on it. Deep plowing depends on your soil and when you do it. There is no danger of plowing too deep in Kansas if you plow a year ahead. Years ago we used to plant our corn early in March. One of the causes of failure is you do not plow early enough in the year.

S. Reynolds: I farmed bottom land on the Wakarusa, with soil from 6 to 10 feet deep. We went down 10 feet, and had not got down to the bottom of the black soil then. I consider you cannot plow that soil too deep. Even six feet deep would be all the better. On upland if I plow deep my crop is a failure. We have got to consider the character of our soil. It will not do to throw sub-soil on top.

FRUIT-GROWING IN WESTERN KANSAS.

By C. H. Longstreth, of Lakin.

Many people question fruit-growing in western Kansas. I hardly see why. We have soil, climate and water all there, if we utilize them. The first orchard west of Dodge City was planted in 1880, at Garden City. It consisted of 180 apple-trees, a few cherries, plums, pears, etc. The trees grew nicely, and when the time came to bear the result was satisfactory; to this time there has been but one failure. In 1892 or 1893 the late frost destroyed them. It is all under irrigation west of Dodge City. I commenced to plant in Kearny county, 45 miles from the west state line, in 1886, and put out 500 apple-trees, some peach, cherry, pear, etc., and aside from the season referred to, when all failed, we have had satisfactory results to present time. From my experience, I do not see why growing apples cannot be made as successful there as anywhere. This season we had some early and some late varieties of peaches that did well. It seems to be the home of the plum and cherry. Strawberries, blackberries and raspberries seem to do as well as could be asked. I see no reason why all or any portion of Kansas cannot be made a good fruit country. As I have said, the possibilities and conditions

exist, if once learned, and how to apply them. There are of course a great many failures. Many plant trees and fail, elsewhere, attributable to careless handling. When you investigate it, you will find it to be failure of the planters to give the proper care. In every instance where trees were properly planted and cared for satisfactory results were obtained. I have about 70 acres in orchard, and will add 20 more. It is only a question of time when western Kansas will be as successful in fruit-growing as other portions. It is useless to attempt much there without irrigation, as our rainfall is light. On the high lands they have a reasonable degree of success in growing without irrigation, but it has not been very successful. There is not a quarter-section in western Kansas but where sufficient water can be raised from the underflow to water 10 acres of land. A man can get a living from 10 acres of orchard. The water is there, and if they put down wells they can get it. There is a sheet of water under the surface all over the upland, as well as the bottom, only deeper down.

AFTERNOON SESSION.

Thursday, December 12, 1895—1:30 p. m.

Called to order by the President. After opening, the President called Vice-President J. W. Robison, of El Dorado, to the chair.

A TALK ABOUT FLOWERS.—By Mrs. L. Houk, Hutchinson.

There are two sides to human nature. In the necessity of things, and in view of the difficulties that beset us, the austerity of climate and the necessity of nutrition and protection of these bodies of ours, we have first to consider, and from the very beginning of things have always had to consider, as paramount the question of food, clothing and shelter. But then, fortunately, the great and good Creator, in His divine conception of man, has provided for more than this. We are so organized that when we have disposed of these things which necessarily first confront us, and have made due provision for comfort, we then turn by as natural a law of our being as the other to things which, though not absolutely essential to the comfortable maintenance of life, yet give a new and different charm to existence.

There is no form of material life which so appeals to and satisfies our sense of the beautiful as flowers. The love for these beautiful children of Nature is not confined to one race or people, nor alone to the petted darlings of fortune. In the rude ages of the world, when men did not lead individual lives, but were only the component elements that made up the body politic over which the king or prince reigned; when no heavenly aspirations to plant a rose-bush or to train a vine could have enlivened their benumbed and restricted souls, they showed their love for flowers by making the capitals of the pillars of some of their grandest temples in the form of the lotus-flower. I think Pharaoh's daughter, when she found little Moses, must have been attracted to some certain spot among the bulrushes because of the overhanging and protecting leaves and blossoms of this darling of the Nile. The path that is bordered with flowers always tends upward, and the tired heart that seeks to rest itself will find it where the roses are telling of the love of God and the lilies of His mercy. Every home is more homelike where flowers

are seen. Their refining grace impresses itself upon the inmates, and softens the little acerbities that sometimes result from the friction of petty toiling.

But the object of this short paper is not to give a general disquisition on floriculture, but to throw out a few practical suggestions to those who have been too busy or too careless to give the requisite attention to this subject. Accompanying the thought that flowers are a prime necessity in home-making is the fact that they can be had so cheap. I think it is not the cost of flowers that deters so many from cultivating them as the want of experience in their care. A quarter of a dollar spent in seeds will make a flower-border about the door that will give back a better return on the expenditure than that amount spent for seed-wheat. But the potential results of this quarter of a dollar's worth of seed must be secured. They must not be thrown carelessly into a rough bed, deep or shallow, as they happen to fall, left unprotected from the drying winds and the burning sun, but the means which secures their proper germination and growth must be used in order to make them a blessing to the home.

Crowding about our imagination, clamoring, like the Kansas politician, to be chosen for the highest honors of place, stands an array of floral beauties that might well make us pause and look, and look again, before making choice of those that may be termed the most worthy. A small list of those, excluding the high-priced novelties, which give back the most generous return to the home florist, (and these are mentioned without attaching any significance to their position in the list,) are: Phlox, petunias, portulaccas, thunbergia, nasturtium and larkspur. A plot confined to these six varieties, well grown and tastefully arranged, would make a garden of delights the whole summer long. Then if there should chance to be a fence near where some graceful vine could disport itself, where the morning-glory could shake out its fairy-tinted blossoms in sweet dalliance with the morning breezes, or the moon-flowers scatter themselves in white profusion through their dark rich foliage, the beauty of the spot would be greatly heightened. There are few things in landscape-gardening which gives such a touch of tender grace as a vine artfully disposed. And while I have outgrown my devotion to that sweet old sentiment of the oak and the clinging vine, as applied to human conditions, yet I have seen few more striking objects in Nature than a tall coffee-bean tree with its body wound round and round, from the base almost to the top, with a bignonia vine, with lateral branches clambering through the head of the tree, all laden and drooping with red blossoms the whole summer through. This vine, which is able to produce such fine effects, is so common that the synonym for its grand technical name is "cow-itch." Then, if one has the desire for something a little more choice, there are the honeysuckles; and a single Belgian or a Halleana will on a summer's day fill the surrounding air for a long distance with the richest perfume. Then, the heavenly-tinted wistaria, which nothing surpasses in beauty, and which flourishes like the sunflower with proper care. If this were not a paper confined to practical suggestions about flowers, I should mention as easily first among vines the enchanting clematis, but I am constrained to advise you to try them sparingly out of doors, as they sometimes bring heartaches and disappointments—at least the finer sorts.

One of the most important agencies to be employed in home adornment are shrubs. Their value is increased by the fact that they become a permanent feature of the landscape when once planted. Those most prized for hardiness and beauty combined are: Spirea Van Houttei, Hydrangea panic-

culata, Philadelphus, Weigelia, Deutzia, crenata, the lilacs, which of late years, in the wonderful increase in their variety of form and color, are perhaps the most satisfactory of all shrubs and Prunus Pissardii, Golden Elder and Kerria, the finest of all foliage shrubs for striking effect in grouping. The Altheas are also specially valuable, occupying a place in summer and early fall with their bloom when other things are scarce. Of the large shrubs, which are beautiful in flower and also fruit-bearing, the Viburnum Opulus, Eleagnus Longipes and dwarf Rocky Mountain cherry are all hardy and of high merit. Best of all, one should plant roses. The culture of roses, and, indeed, of all flowers, is easily learned by those who take an interest in it. Reynolds Hole, the English poet rosarian, says that he who would successfully grow roses must have roses in his heart. This is the key of the whole matter. If you love roses, your difficulty in producing them will rapidly grow smaller. The hardest roses belong to the class known as Provence, or what we now call the June roses, and the moss-roses. All of these will stand our severest winters without protection. The best of these two classes are: Madam Hardy and Madam Plantier (both white), Magna Charta (pink), and Centifolia or cabbage-rose (rose color). Of moss-roses probably the best are: Crested Moss (deep pink), Princess Adelaide (pale rose) and White Bath. Of the climbers, my first choice, in view of their hardiness and easy management, are Baltimore Belle (pale blush) and Queen of the Prairie (bright red). Newer candidates for public favor are Mary Washington and Crimson Rambler, the latter of which seems to be specially meritorious. All these I have mentioned are most excellent in their way, and may be said to be indispensable as garden-roses, yet they are, except as to the last two named, quite limited in their period of blooming. It will hardly do to stop here; we must have something that will cover a part of the summer and late fall months. This need will be best supplied by the hybrid perpetuals, which are not perpetual in the sense that the teas and other monthly roses are perpetual, but which still may be relied on for a second crop of blooms. These are the most magnificent of all roses in flower, and while they want more care and attention than the slip-shod treatment usually accorded to those already mentioned, they are nevertheless absolutely indispensable. This class may be separated into three divisions: First, those which are hardest; second, those most highly scented, and third, those which are the freest bloomers. In most cases we have to be content with varieties which occupy a place in only one, or at most in two of these divisions. There are a few honorable exceptions. Marshall P. Wilder, cherry carmine in color, stands conspicuous in all three; Baronne Prevost, pure red color, is entitled to the same distinction; General Jacqueminot stands in the second and third divisions; Anna De Diesbach (carmine) is among the foremost in the first and third divisions; Mabel Morrison (white) is also in the first and third, as is also Countess Serenyé (pale silvery-pink), this old variety being, in fact, as free and perpetual a bloomer as a tea, though not always in wet weather having perfect flowers. Pierre Notting is one of the most highly scented, and is almost black in color, and the same may be said of the Prince De Rohan and the Earl of Dufferin. The following are entitled to honorable mention: Alfred Colomb (crimson), Madam Charles Wood (crimson), Mrs. John Laing (pink), Paul Neron (also pink, and one of the largest roses), John Hopper (rose with carmine center), Madam Alfred De Rougemont (white, and always in bloom), Gloire Lyonnaise (white tinted with yellow, the nearest to a yellow hybrid that we have), Jean Libaud (crimson maroon), and last, but not least, that old favorite, Louis

Van Houtte. This list could be multiplied indefinitely, and it seems invidious to mention any where there are so many to be left out which are hardly less entitled to be named. It is far from my purpose to conceal the fact that without some diligence and judicious care any attempts to grow fine roses will be disappointing. In this, as in most things, there can be no excellence without intelligent labor. But do not be discouraged from making the attempt. The conditions of success are not really difficult. A plat of tolerably good ground (the richer the better), with good drainage, cultivation, and some winter protection in the case of the hybrids during our severe zero weather, are about the sum of what is required. See that these conditions exist, and you will be rewarded a thousandfold.

I once made an experiment on a rather intractable piece of ground, where the subsoil was so hard as to be almost impenetrable, by digging a trench three feet in depth, and filling in with broken stone, brick and other debris one foot, then filling up with well-enriched top soil, and planting along this trench so prepared a row of General Jacqueminot roses 100 feet in length. One-year pot-plants from a greenhouse were used. The first year I was rewarded with a display beyond my expectations; the second year, that effulgent line of General Jacks, fringing an open velvety-green lawn, was such a joy and glory to all beholders as is seldom surpassed in Kansas or elsewhere.

I will only say further that I expect all those who have not already had an awakening in the culture of flowers will make the commencement now, and I can assure them that the pleasure will grow on them; that the love for these cunningest creatures of excelling Nature will grow from day to day, and increase by what it feeds on.

NATURE'S LESSONS.—By Mrs. Fanny Holsinger, Rosedale.

"To him, who in the love of nature holds communication with her visible forms, she speaks a various language." So says our nature-loving poet William Cullen Bryant, and this thought came to me in the contemplation of my subject. The poet seems to convey the idea that the lessons learned from nature depend much upon the receptive condition of our minds. Some see in a field of waving grain or a blooming, orchard only a well-filled purse at harvest; while this conclusion is not to be despised, neither should it occupy too large a place in our lives. Nature is lavish with her gifts to us and has been kind to so combine the useful with the beautiful, that our lives may not be monotonous or humdrum, for no matter what our occupation may be, we may see the beauties of nature all around us if we will only open our eyes and ears to her lessons, for truly "she speaks a various language." The occupation of farming is especially desirable, for one who loves to commune with nature, for he comes in contact with her in her primitive state. It is delightful to be awakened on a bright morning by the voices of our feathered friends; even "the cock's shrill clarion" is not unwelcome as he calls to the duties of the day. The neighing of horses, the lowing of cattle, even the voices of pigs and chickens are welcome sounds, for we know they appreciate the kindness bestowed upon them. What is more elevating than to co-operate with nature in bringing forth fruit, flowers, grain and vegetables to gladden humanity. How many there are who see no beauty in nature and so make drudgery of wholesome, pleasant labor; for work is our greatest blessing. Some philosopher has said: "Every man's work is his life preserver." No work is worse than overwork, for idleness contaminates the soul as water standing still becomes foul and impure. Work drives away depression, gives appetite for

food, stimulates the intellectual faculties, provides the comforts of life, develops the powers of man and the resources of nature. But we must work intelligently. Nature teaches us to be systematic if we would be successful, for she works on mathematical principles.

She teaches that there is a time to work and a time to rest, and if we would conform our lives to her teaching there would be more harmony and less discord around us. I well remember my younger days when life was full of care and my heart undisciplined, I often thought while reading of the beauties of nature, if the writer had as much hard work to do as I—had cows to milk, chickens to feed, meals to cook and babies to care for, besides numberless other duties, there would be little time to look at the beautiful things of which they wrote. Since I have grown older, though I have as much care, I have learned to look up, and be lifted up above the cares and burdens of life and mingle the beautiful with the useful.

Every phase of life has advantages and disadvantages. Many women confine themselves with the walls of home, honestly believing it duty, and there is certainly no higher, holier duty. But to be a good home-keeper one must know something of the outside world, for how can a mother prepare her children to go out in the world if she knows not the dangers that surround them or the pleasures in store for them. A woman needs interchange of thought for intellectual development as much as she needs ventilation in the house for physical development of its inmates. In a paper read before the Wisconsin State Horticultural Society, a lady said: "I want the women of the farm to go visiting more and have company more. I want her emancipated from rag carpets and bed-quilts, soul-destroying appliances that they are." There are cases in which there is an excuse for making a rag carpet, though I confess it is doubtful economy, and it is surely a waste of time for a woman who can by other means furnish her home, to cut old clothes into strips when that time should be used to qualify herself for intellectually instructing her children, by keeping intellectual step with her husband or by striving to arouse him to more vigorous exertion to keep pace with her and the times. When I was a child we had a visitor at our house who said she "would much rather hear men talk than women because they had so much more sense." I wondered if this were true; and if so, why. As I grew older I solved it in this way: The women talked of the different departments of household economy—making pickles and preserves, house-cleaning, making baby-garments, etc. Useful all, but not considered valuable because so common; while men talked of future punishment and rewards, of predestination, transubstantiation, and the like, and I thought them wise indeed to discourse of things that I could not comprehend. I discovered as I grew older that they knew nothing about them either, so I concluded that women who knew what they talked about were as wise as men who talked about things of which they knew nothing. Women's opportunities to-day are great, and she should improve them; but they bring added responsibilities. Women should talk of domestic art, and be interested in adorning the home and making it comfortable, but this should not form the entire substance of her thought and conversation. "The life is more than meat, and the body than raiment." We should take a broader view of our duties and the influence we exert, for future generations will be advanced or retarded by our actions. We should teach the girls household art, a thing of great importance. We should teach the duties of fatherhood and motherhood, so when they come into their kingdom they will be prepared for their duties and responsibilities, so the new man and

new woman may walk side by side through life fulfilling the divine law of justice. But not to the farmer alone is the opportunity given to see nature in her beauty. The miner underground sees in beds of coal and silver and gold stored away the handiwork of nature. The carpenter sees in the various woods a variety of colors and designs of wonder and beauty. Nature teaches us that "God is love." We see manifestations no where more than in the flowers, which Wilberforce calls "the smiles of God's goodness." Why did the Creator of the Universe give these beauties if not to brighten our lives and make us happy? "God might have made the earth bring forth enough for great and small, the oak-tree and the cedar-tree, and not a flower at all." Can we not plainly see love for His children in these delicately-painted beauties? Can we look upon a flower and enjoy its "scented breath" and not call to remembrance the wisdom and majesty of God? I see and feel and hear the message of divine love say, "God is love," "God is love." Even the untutored mind of the Indian sees God in nature. Shall we do less? Nature teaches us that the principle of evolution is not only a theory but a fact. I do not mean the evolution of man from a lower order; of this I am uncertain. Scientific investigation reveals to us facts new to our understanding which have existed for ages. But recently we have learned the value of electricity; it is not new, and who knows but we may in time control the moisture in the atmosphere, and water the earth to suit our needs. If we can control the lightning, why not the clouds above us and the water beneath us? God created every thing for our good, but we learn slow how to utilize these gifts to His glory and our material welfare.

The world is in a state of constant development from lower to higher forms of existence; from a human standpoint it seems to stand still, because of human ignorance or depravity. Bryant portrays the principle of evolution when he speaks of the creation as "being finished yet renewed forever." To the infinite it was finished in the beginning; to the finite it is renewed day by day through all time. He who looks into nature's hidden motives will be constantly making discoveries, which are not new to their Creator. We are taught that nature was perfect in Eden, and because of sin, thorns and thistles grew, and fruits and flowers degenerated. We know they came to us imperfect, and our duty, our pleasure, our opportunity is to restore their lost beauty and perfection. In the beginning everything was created. Professor Lyndall says he finds no proof of spontaneous production of even microscopic life, but much proof to the contrary; we believe his theory correct. The new discoveries in plant life are due to the development of germs, which always existed, and which, under favorable conditions, by nature's laws have evolved into their present state. The horticulturalist delights to study these conditions, as they are a pleasant accompaniment to hard work. The Kansas State Horticultural Society has done much to restore the earth to its Edenic beauty. In studying these things we call up other forces in nature which have brought about a unity of thoughts, a realization of ideas that evolved many of these thoughts. As a result we have organizations and institutions that a quarter of a century ago were practically unknown. The temperance congress, the prison congress, the peace congress, all tending to lift humanity to a higher plane, declare the certainty of evolution, or, in other words, "the world do move." Not only from the wonders on the earth do we get our lessons of the Creator, but "The heavens declare the glory of God, and the firmament sheweth His handiwork." Thus God shows His love for His children, regardless of class or nationality, and no combine can exclude anyone from the

enjoyment of the glories of the firmament, though men, women and children are shut up in tenement houses in large cities where they seldom see the sun or get pure air. But God is ever watching above His own. In His own good time all things will be righted. Nature teaches us the certainty of a future life. As we look upon the face of nature to-day we see desolation, the ground brown and bare, the trees stripped of their beauty. We saw the leaves that graced them a few short months ago fade and die and fall to the ground, where they are fast returning to earth, but we know that mother Nature will restore their beauty at the appointed time. In a few short months we shall behold them clothed in new beauty, the same as before, yet not the same. They will be renewed, there will be a resurrection, and all nature will become new. So of our bodies; in the process of nature they will return to dust, but in God's own time they too shall be clothed in new beauty; and as the leaf-mould helps furnish vegetation and make it vigorous, so may the dust of our bodies assist in the resurrection of a purer, better life. But some may say, while vegetation was apparently deprived of life, there was concealed a germ needing only the appointed time and the warm rays of the sun to give it new life, and that part of it had lost entirely the life-given element, and would not again put forth bud or blossom. True, but the soul is of a higher order, containing a germ that cannot die because a part of God himself. Christ has said, "As I live, ye shall live also." One of the poets puts this thought so beautifully in "The Resurrection of Nature:"

See God touch Nature, on her bier,
Low-lying, gray, and cold and still:
"Back from the dead!" He cries to her,
And lo! her pulses throb and thrill!

The miracle is wrought; the dead
Stands on her living feet once more;
God wraps the grave-bands in their place,
And leads her forth from the tomb-door.

Behold her! Nature bidden back
To life again by God's great voice;
Behold her new and wondrous youth,
And seeing her, oh, hearts rejoice!

See the earth make a tuneful feast,
And spread for her a welcome board;
And sitting in the honored seat,
He who brought life to her—the Lord! • •

Like Mary, with her precious nard,
One guest from the dim woods is there,
Pouring from out her opal flask
Sweet perfume on the amber air.

Come to the thankful feast, oh, hearts!
Come to the feast, spread wide and broad:
Join with winds, the birds, the flowers,
To welcome Nature and her God.

Frank Holsinger, jr., was called for to give his experience in Japan.

Mr. Holsinger, jr.: I was in Japan in the spring; there were few flowers to be seen, but the plum- and cherry-blooms came out then. Those of you who were here last night heard Professor Georgeson speak of them. The plum- and cherry-blooms are prized. While in Tokio I went to a place called Wans at the time these blooms were out. We came to a large pro-

cession. There must have been two or three dozen children, and they had branches in their hands and a banner. It was a procession in honor of the plum- and cherry-blooms, and wherever there was a cherry-tree you would see the Japanese around with baskets of dinner, to stay all day and gaze at the blooms. All along the roads I have found the Japanese watching the blooms. The cherry does not fruit, but is held sacred. The plum does fruit. All over Japan are flowers in great variety. Nowhere are flowers so highly prized. Few of their flowers have any odor, outside the plum and cherry. Their flowers are very brilliant. I would not take it that they cultivate flowers because they are brilliant. The cherry- and plum-blooms are regarded more as a deity than otherwise. I got to Japan in January, and left the 18th of April. I was at Tokio about the 1st of April. The only fruits I saw were strawberries and persimmons—the strawberries in the spring, and when we were up in the fall I saw persimmons. No fruit in Japan will compare with persimmons. Eaten green it does not pucker the mouth. They like it best green. If you go to a Japanese dinner, they will always set up persimmons that are not ripe. Europeans prefer them ripe. We find persimmons very frequently as large as a good-sized Ben Davis apple. When we were in dry dock a large tree overhung the deck, and there was 5 to 11 bushels of fruit on it. Apples are imported.

Edwin Taylor, Secretary: I am in such a state of transport and emotion over these subjects talked of this afternoon that I doubt where I am. We have been here now nearly three days. Most of that time we have been down under the soil; down among the irrigating ditches and apple-barrels and potatoes. This afternoon we have moved up into the third story of horticulture, and it seems to me it is an agreeable change. The Quakers say we do not live up to our privileges much of the time. If we had thoroughly understood ourselves we would have come up to this third story sooner. I suggest that there be more "ladies' days" on the programme next year.

On motion, it was ordered that the Treasurer be relieved, and the Secretary be requested to present annually an itemized statement of the expenditures of the state funds.

On motion, the thanks of the Society were tendered to the president and secretary of the Missouri State Horticultural Society for their presence and assistance during the meeting.

On motion, adjourned sine die.

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